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TYPHUS FEVER IN CHARITY HOSPITAL*

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Typhus fever undoubtedly existed for many hundreds of years before 1536 but not until then were the first cases recorded in medical literature. From that time until 1837, when William Wood Gerhard of Philadelphia differentiated between typhoid and typhus, the two diseases were considered to be identical. Following this differentiation it was not until 1906 that it was shown that the blood of typhus patients in the acute stage is infectious when injected into susceptibles, and three years later the human body louse was proved to be the natural transmitting agent. The following year, 1910, Howard Taylor Ricketts, distinguished American scientist who had been working in Mexico with tarbardillo, the Mexican typhus, published in the Journal of the American Medical Association a description of the minute intracellular bodies which he had seen in the endothelial cells of these patients, and thought were inclusion bodies characteristic of typhus. In 1913 a German, von Prowazek confirmed Ricketts' work and agreed that these were characteristic inclusion bodies, and it was not until three years later that Rocha Lima recognized and proved the so-called inclusion bodies of Ricketts as the causative micro-organism of typhus. In honor of Ricketts and von Prowazek, both of whom had died of typhus while studying the disease, Rocha Lima gave to these small intracellular organisms the genus name Rickettsia, and the species name Prowazekia, thus Rickettsia prowazeki. Just before Rocha Lima published his discovery, two Austrians, Weil and Felix, searching in Serbia for the etiologic agent of typhus, isolated from the urine of one of their patients *Bacillus proteus vulgaris* and found that this patient's blood serum agglutinated a suspension of these bacilli. Naturally they thought this was the pathogen of typhus and continued to investigate along these lines. By the time Rocha Lima's Rickettsia was established as the true pathogen they had developed an agglutination reaction which has been ever since of great value as a positive laboratory confirmation of the clinical diagnosis of typhus, the Weil-Felix reaction.

In 1913 Fraenckel described the pathology of typhus as being confined to the blood vessels with endothelial swelling and fragmentation, formation of thrombi in these vessels, perivascular round cell infiltration, and rupture of small vessels beyond the points of complete thrombotic occlusion with hemorrhage into the tissue, the vessels of the skin and brain being particularly involved in this pathological process. In 1919-20 the American Typhus Commission to Serbia further described the pathology and extensively studied the disease from all standpoints and it is from the publications of this Commission that much of the present day knowledge of typhus has come.

In 1898, N. E. Brill, a Polish immigrant physician practicing in New York, observed sporadic cases of what he considered to be a mild form of the typhus he had seen in Poland. In 1910 he published a description

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of a collection of these cases and from then to 1926, cases of typhus seen in the different states were considered as merely cases of European typhus of a mild nature and were known as Brill's disease. In 1926 K. F. Maxcy of the United States Public Health Service showed that the two were epidemiologically unlike and proved that the body louse could not be the vector of this then called Brill's disease. He suggested the rat as a reservoir of the disease and some other insect than the louse as the transmitter. In 1931, R. E. Dyer, of the United States Public Health Service, further separated the louse-borne typhus of Europe from the sporadic typhus of the southeastern United States by proving the rat flea to be the vector and the rat the reservoir host of these endemic cases of typhus and because of this relationship gave the name 'murine' to this form of the disease. Since then it has been accepted that the two forms of typhus, though similar, vary greatly in many respects and typhus has been definitely divided into two types, the epidemic and the endemic, or murine.

Epidemic typhus is the type which is raging in Europe now. It is transmitted from one patient to another by the host specific body louse, is a very severe disease with high mortality (as great as 70 per cent or more in some outbreaks), occurs as the name describes in epidemics, and is especially prevalent where there is human crowding, cold, hunger and general unhygienic conditions. It occurs principally in winter and early spring where the cold prevents frequent bathing and change of clothing, promoting louse infestation, and other than in time of war or other human catastrophy is found almost exclusively in the lower economic strata.

Endemic typhus, though a much milder disease, is caused by the same Rickettsia prowazeki but of a different strain, these strains being morphologically and immunologically identical but able to be differentiated by injection into laboratory animals. The endemic typhus strain in these animals is more virulent and incites a greater tissue reaction. Endemic typhus is primarily a disease of rats, which it affects little or not at all, and is transmitted only incidentally from rat to man by the tropical rat flea, never as far as is known, from one human to another. It is especially prevalent in late summer and early fall and tends to occur sporadically in those who are exposed to rats and their fleas, either at home or at work. For this reason it can and does occur in all classes of patients and not as the epidemic, only in the lower economic strata.

There is no epidemic typhus in the United States today but endemic typhus is present and is becoming more widespread and frequent in occurrence. This is the form we are seeing at Charity hospital and all that follows has to do only with this endemic type of typhus unless epidemic is specifically mentioned.

Though mild typhus had been known to be present for many years in Georgia and Alabama to the east of Louisiana, and in Texas to the west, it was not described here until 1929. W. C. Rucker reported the first case that year and a few months later John H. Musser recognized and reported the first case to be observed at Charity Hospital. From then until 1939 there was some increase in the reported instance almost every year but only 130 cases were reported in Louisiana during that ten year period. In 1939 a sharp increase in the incidence occurred, 117 cases being reported. In 1940 there were 118 cases, and last year a new high incidence of 194 cases reported to the Louisiana State Board of Health. During this same year, 1941, there were almost 3,000 cases in the United States and of these 94 per cent were reported from the coastal southeastern United States and Texas. The term coastal southeastern United States is here used to include those states from North Carolina south along the Atlantic coast through Florida and west along the Gulf of Mexico through Louisiana and including Texas. From these states, as stated, 94 per cent of last year's typhus was reported and in previous years a similar high percentage of the total re-

ported in the United States has come from this group.

Of the 194 cases in Louisiana, 44 were observed at Charity Hospital last year. Although 44 is a small series to analyze for characteristics of a disease so prevalent as endemic typhus, the fact that the findings in these cases so closely coincide with those described in the literature proves that it is murine typhus which we have been seeing and suggests that the few discrepancies these cases bear to the described endemic typhus may be worth mentioning.

In this series there were 24 male and 20 female, 33 white and 11 colored patients, and the age, though it ranged from seven to 62, averaged 33 years and all but seven of our patients were between the ages of 15 and 50. Thirty-two were from urban and 12 from rural environments. Between July 15 and October 15, 27 cases were observed, more than 60 per cent of the total. Because so many of our patients were housewives or others who had no special occupational environment, the home environment was of more importance than the occupational in this series. However, of those who did have definite occupations there was a predominance of farmers, trappers, foodstore workers, fishermen, bakers and shipyard workers. In nearly every case there was a definite history of having rats in the home or working environment, or both. Twelve had actually handled rats with bare hands, three others had handled mice, seven gave histories of having had flea bites, and two had been bitten by other insects prior to the onset of the illness. The incubation period could not be arrived at in this series but is given in the literature as five to twenty days, with an average of twelve.

SYMPTOMATOLOGY

The clinical symptomatology was fairly constant. The onset was sudden in 75 per cent of patients but prodromata ranging from two to nine days were described. Shaking chills at the onset were described by nearly half, and eleven more had chills within the first 48 hours of illness, making a total of 32 of the 44 who had true shaking chills early in the course of their disease. Of these, 24 had multiple chills and eleven had chills persisting past the fifth day of illness. Only six had no chills in the entire course, and four others only chilliness. Headache was a primary symptom in thirty, was described as being very severe or splitting, was not relieved by aspirin or any of the other ordinary analgesics, and was the most constant of symptoms in our cases, all but one patient complaining of this at some time or other. Other aches and pains were also quite prominent, these being in order of frequency, backache, chest pain, neck pain, generalized muscle and joint pain and abdominal pain. Every case gave a history of some severe pain as part of the principal symptomatology, either at the onset or early in the course, and nearly all had severe pain while in the hospital. Weakness was fairly marked in 24 but in none of these was prostration approached. Sixteen were slightly weak or not at all. Gastrointestinal symptoms, particularly nausea and vomiting, were present in less than half, all of these early in the disease. Only one patient had diarrhea. Respiratory symptoms were not present as often or as prominently as has usually been reported. However, such symptoms as cough, sore throat, chest pain, and coryza were present sufficiently often to have 21 of the patients' chests x-rayed.

CLINICAL SIGNS

Most of the patients were at home between five and eight days before seeking hospital attention. A few came in before the fifth day and ten after the eighth day. Fever was present in all. The type of temperature curve which these patients presented depended upon the vigor and nature of the antipyretic measures used, and the number and severity of chills. In those few patients who had no chills after being hospitalized and who were given no temperature-reducing measures, the temperature was constantly elevated, varying not much more than one degree from maximum to minimum in any 24 hour period before the defervesence. The fever lasted from 12 to 25 days in our cases but practically all were

terminated between the thirteenth and eighteenth days. The fever disappeared by rapid lysis in nearly every case.

In 30 of the 33 white patients a rash was observed. In only one of the 11 colored patients was there a rash, and this patient had very light skin. The rash appeared before the end of the first week in most, as early as the fourth day in a few. It was red or rose colored in all, appeared on the abdomen, chest, back, upper and lower extremities, in a very few cases was seen on the soles and palms, and in one case on the neck. There was no rash on the face in any of these patients. It faded on pressure in nearly every case, was maculo-erythematous in the majority, but maculo-papular and palpable in ten. Only two had hemorrhagic spots in the skin and these were not large. The rash did not appear in crops, had no particular form, was very profuse in some and more sparse in others, but was always present in greater numbers of spots than the rose spots of typhoid fever are usually. This rash lasted a variable period of time, had disappeared by the twelfth day in all but one, and in some had vanished as early as the eighth day.

The neurologic signs were most conspicuous by their absence. This has been noted many times in reports on endemic typhus but in the epidemic typhus neurologic signs and symptoms are especially marked. The coma usually seen in these epidemic cases is what has given the disease the name typhus, which is from the Greek and means "like a cloud," referring to the "cloudy" mental state. Only two of the patients were comatose, one of these deeply so for three days, one was excited to a state approaching delirium, two were stuporous, and one had a stiff neck. Otherwise these patients were no more affected mentally or neurologically than the degree of fever would warrant.

The respiratory signs were even less prominent than the respiratory symptoms. Subcrepitant rales were heard over one or both bases in six but there was clinically detectable no consolidation, no cyanosis, no pleural effusion and the respiratory rate was not unduly increased, nor was there any other sign of respiratory disease. Of the 24 x-rayed, four showed some evidence of bronchopneumonia; the others were completely negative.

Signs of cardiovascular involvement were negligible. There was tachycardia proportional to the degree of fever in all, no clinically detectable dicrotic pulse, no sign of right or left heart failure, no venous or arterial thrombosis, no fall in blood pressure or any other evidence of peripheral vascular collapse.

There was distention in one, tenderness on abdominal palpation in another and in nine the spleen was definitely palpable. In three others the spleen was questionably palpable, making a total of 12 out of 44, or about 25 per cent with palpable spleens. The liver was not palpable in any and only one was jaundiced, this one but slightly. When the spleen was palpable it was so early in the disease and remained palpable throughout.

Conjunctival injection was present in about half but was nothing like so marked as is the conjunctival injection in Weil's disease.

LABORATORY TESTS

Most of these cases were fevers of undetermined origin early in their hospital course and as fevers of undetermined origin were subjected to a large number of laboratory tests. Blood cultures, urine and stool cultures and many blood smear examinations were done and none of these were positive for any organism. There was febrile albuminuria in five, this disappearing in all of these as the temperature became lower. Five had blood urea nitrogen determinations and all of these were within normal. Two had spinal surveys, all findings within normal. Two of them had positive Klein and Kolmer tests during their febrile period which became negative and remained negative after the temperature was normal. There was a definite leukopenia early in the disease, this being constant up to the sixth day. After that day the blood count in most returned to within normal limits, a relative leukopenia, and late in the disease

a polymorphonuclear neutrophilic leukocytosis developed in about half of the cases.

Up to the seventh day the few blood serum agglutination tests which were done using *Bacillus proteus* OX19 showed no agglutination of this organism. On the seventh day one of seven done was positive, on the eighth day six of 11 were positive, on the ninth day one of two done was positive, on the tenth day eleven of twelve done were positive and after the tenth day all that were done were positive. The macroscopic agglutination test was done, starting with blood serum dilutions of 1:80 and going through dilutions of 1:640. In all cases after becoming positive, the titer increased throughout the hospital stay or maintained its highest attained level.

DIFFERENTIAL DIAGNOSIS

The diagnosis before the agglutination became positive was principally concerned with differentiation of typhoid from typhus fever. Malaria was the next most frequently considered diagnosis; influenza, bronchopneumonia and undulant fever following next in that order. Tularemia, amebic liver abscess, Weil's disease, drug rash, pyelonephritis, infectious mononucleosis, meningitis, malignancy with cerebral metastasis and craniocerebral injury were each mentioned prominently in the differential diagnosis of one of these cases. Dengue, relapsing fever, smallpox nor spotted fever, were mentioned in the differential diagnosis of any of these patients because these diseases are not seen at all or are quite uncommon in Louisiana. In places where both these and typhus occur the differential would undoubtedly be very difficult early in the course.

COURSE

The average hospital stay in this group was 13½ days, an average of 21 days elapsing between the onset at home and the day of hospital discharge. The course of the rash and the fever have been described. The headache and other aches and pains persisted in many cases to the twelfth day but in all, these symptoms had disappeared before the temperature became normal.

TREATMENT

The treatment was almost purely symptomatic, maintenance of fluid balance, strict bed rest, and giving a light nourishing diet being the principal parts. Codeine and aspirin were used very freely for relief of pain and reduction of temperature. Alcohol and cold water sponges, ice caps and other temperature-reducing measures were also used frequently. All of the common sulfonamides, except sulfadiazine, were used in full doses in one or more of the patients before the diagnosis was established, and with no beneficial effects at all. Quinine sulfate, grains 10 t.i.d., was given to three patients and this drug did effect a reduction of temperature for two days after it was given in all three of these patients but thereafter the temperature resumed its former high level though the doses were continued.

COMPLICATIONS

The complications were very few. One patient developed bronchopneumonia after he had been free of fever for four days. This was suspected of being a Rickettsial pneumonia but this was not proved. Only one of these patients developed a bed sore, a small one which healed readily. Other than these there were no complications worthy of mention.

MORTALITY

In this small series there were no deaths, and I have been able to find no record in Charity Hospital of a death from typhus fever in the past three years. The mortality from all the cases which have been reported in Louisiana since 1929 is 4.4 per cent of the total incidence. In Georgia, where large numbers of cases are very accurately tabulated every year, the mortality from typhus has usually been from 4 to 5 per cent. The mortality from typhus in the United States as a whole, however, is usually given as about 1 per cent. It may be of interest to report here that in 1941 there were 86 cases of typhoid at Charity Hospital and that of these 13 died, showing that despite the increase in typhus, typhoid is nearly twice as common here and is certainly very much more dangerous.

SEQUELA

Thirty of 44 typhus patients in 1941 have returned for examination from three to 13 months after discharge. In this group the instance of sequelae has been very little. Only one has noticed any decreased tolerance to cold; four noticed some increased shortness of breath on exertion since recovery; three had edema of one or both feet and ankles after hospital discharge but this was of short duration and none had any swelling at the time of examination. The duration of weakness during convalescence varied. Five of the patients were able to go right home from hospital discharge and resume their usual routine but the other 25 required from two to more than six weeks to regain strength and some had not completely regained their former endurance after four months. None had ever had any disease which might even be suspected of having been typhus and there was no evidence that any of these patients had transmitted the disease to anyone else. Four of this group reported other cases in their neighborhood, either before or since they had typhus. Four others came from the same community and reported that two additional cases had occurred there. (This was from a small settlement in Lafourche Parish and these patients were trappers and their families.)

All of those who returned were tested for agglutination of *Bacillus proteus* OX19 and in only ten did the blood serum agglutinate these bacilli when diluted 1:80 or more. Of these ten, five agglutinated in titers of 1:160 and one of these five to 1:320. All of this last group of five had recovered from typhus six months or more before these agglutinations were done. Usually, however, the demonstrable humoral immunity was found to have disappeared very quickly and in five patients who had typhus in 1939 and five who had the disease in 1940, the blood serum in 1942 agglutinated *Bacillus proteus* OX19 in no titer above 1:20 and only one agglutinated in this very low dilution. This does not indicate at all that the having of the disease and recovery has conferred no immunity. Despite the fact that it can not be demonstrated by agglutination reaction, the immunity has been found in all cases to be almost complete, few cases of subsequent infection ever having been reported.

PREVENTION

The prevention of endemic typhus has to do with rat control. In the bibliography is a reference to the excellent lecture of R. E. Dyer who discussed this control thoroughly in the Charles Franklin Craig lecture for 1941. According to recent literature the vaccine, which is available to those who need to be so protected, promises to be of great immunizing value but at present it is neither necessary nor advisable to vaccinate against endemic typhus. Those who may be exposed to epidemic typhus present a different problem and should be immunized by vaccination and this immunity stimulated every four to six months by another injection of killed *Rickettsiae prowazeki.*

SUMMARY

1. Endemic or murine typhus is spreading and increasing in incidence in the United States, particularly in the southern United States, and of a special interest to us, in Louisiana.

2. The disease, as has been seen here, corresponds closely to the descriptions of endemic typhus in the literature. Our cases have been characterized by sudden onset, chills, high fever, weakness, headache and other aches and pains, signs and symptoms of respiratory infection, by the appearance just before the end of the first week of a maculo-erythematous rash which fades on pressure, by splenomegaly in about 25 per cent of the cases, by a course of approximately two to two and a half weeks of fever terminated by rapid lysis, and followed by convalescence of two to six weeks or more before strength is regained.

3. There is a leukopenia early in the disease and up to near the end of the first week. Then the blood count becomes within normal, which with the elevated temperature may be considered a relative leukopenia, and it is only later in the disease that

a leukocytosis develops, and this in only a small percentage of cases is marked.

4. In all of these patients there developed blood serum agglutination of suspensions of *Bacillus proteus* OX19. This agglutination appeared early in the second week and in all cases was present in serum dilutions of 1:320 or more. This titer either increased after it appeared or maintained its highest attained level throughout hospital stay but disappeared within a few months after recovery.

5. The disease in our series occurred relatively more frequently in females and in colored patients than has usually been reported.

6. A history of contact with rats was obtained in nearly all patients.

7. The disease appeared most often in urban environments and in late summer and early fall.

8. Although there is no specific treatment, the mortality is very low; no deaths occurred in our small series, and the complications and sequelae were negligible. Sulfonamides and quinine were used but with no beneficial effect.

9. There is a vaccine for immunization but as far as endemic typhus is concerned prevention has to do entirely with rat control.

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DISCUSSION

Dr. John H. Musser (New Orleans): There are three comments I would like to make on this very interesting presentation by Dr. Joseph. First, I would like to say that I would like to congratulate the author on his study as well as Dr. Michaels who presented the previous paper. I wish that more of the young men connected with Charity Hospital would make use of the tremendous reservoir of material available to them. After all the average practitioner of medicine will see a case of hematoma of the vulva about once in every ten years or a patient with typhus fever but right here in the Charity Hospital there is this almost unbelievable mass of material which largely, on account of the question of time it takes to analyze a large series of cases, is untouched.

My next comment has to do with rat control. I believe that the effort that Dr. Whitney is making here in the City of New Orleans to help eradicate rats will be of tremendous value to us as citizens. I do not know your particular neighborhoods but I know up in the district in which I live the rats have been very prolific and numerous and are man-size rats. If they can be eradicated, or at least materially reduced in number, I think it will be a distinct public health advance.

The last comment I want to make has to do with the physical signs. I was quite surprised to note that only about half of Dr. Joseph's cases had conjunctival involvement. To my mind that is the most outstanding suggestive physical sign that we have irrespective, of course, of rash, because when the rash appears the diagnosis becomes comparatively easy in white individuals but I imagine —I have not seen colored people with it—rather difficult with the colored population. These people have a florid appearance and added to that, marked conjunctival injection.

Dr. Edgar Hull (New Orleans): I have no discussion except to state that those of us here have been fortunate to hear Dr. Joseph's discussion on the clinical aspects of typhus fever and I think we should urge those not here to read his

paper when it is published. This is a description of the disease not as Dr. Joseph has read about it but as he has seen it. I think it is a very valuable contribution.

Dr. Cheney C. Joseph (In closing): I have nothing to add but to thank Dr. Musser for bringing out the fact that conjunctival injection has been more frequently observed in most cases than I have reported in this series. Perhaps I have used as criteria for reporting injection of the conjunctiva a more marked injection than has been generally observed in our cases. I have read that this is a quite helpful diagnostic sign.

CEPHALIN CHOLESTEROL FLOCCULATION AS A LIVER FUNCTION TEST

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In 1938 Hanger first proposed the addition of an emulsion of cephalin cholesterol to blood serum as a means of estimating the hepatic function. Although the principle of the resulting flocculation in positive cases was not definitely known, it is now thought by Hanger[1] to depend upon the capacity of an altered globulin constituent of the serum to become affixed to the colloidal elements of the emulsion.

Since the introduction of the test, various investigators[2, 3] have reported studies of its efficiency. The report herewith presented consists of a study of the cephalin cholesterol in 100 cases, with a comparison of this test with that of Takata-Ara.

TECHNIC

CEPHALIN-CHOLESTEROL TEST (HANGER)1

A stock solution is prepared by dissolving 100 mg. of sheep brain cephalin and 500 mg. of cholesterol in 8 c.c. of ether (Squibb's anesthesia). This solution can be kept many months without deterioration in a well stoppered container. An emulsion of a cephalin cholesterol complex may be prepared by adding (slowly and with stirring) 1 c.c. of the stock ether solution to 35 c.c. freshly distilled water warmed to 65° to 70° C. and then heating slowly to boiling. The mixture is allowed to simmer until the final volume is reduced to 30 c.c. During the heating, all coarse granular clumps are dispersed to a stable, milky, translucent emulsion and all traces of ether are driven off. After cooling to room temperature the preparation is ready for testing, which consists of adding 1 c.c. of the emulsion to a test tube (preferably a centrifuge tube) containing 0.2 c.c. of the patient's serum diluted with 4 c.c. of normal (0.85 per cent) saline. After thorough shaking and stoppering with cotton, the tube is allowed to stand undisturbed at room temperature and notation is made at the end of 24 and 48 hours as to the amount of flocculation and precipitation that has taken place. With normal human sera the emulsion remains as a stable homogenous suspension but with sera from patients with diffuse hepatitis the lipoid material tends to flocculate and precipitate to the bottom of the tube. A++++ reaction indicates a complete precipitation leaving the supernatant liquid water clear. Gradations of the reaction between negative and ++++ are designated in terms of +, ++, and +++. No test should be regarded as negative until 48 hours have elapsed without flocculation.

Few precautions are necessary. The serum should preferably be fresh or preserved at ice box temperature. Plasma also may be used but the presence of various anticoagulants creates uncontrollable uncertainties. The lipid emulsion, if properly prepared, remains stable for many days but comparable results can be expected only if it is prepared freshly on the day it is to be used. It is important to measure accurately the various ingredients and to employ only carefully washed glass ware. Traces of heavy materials or strong acids may give rise to erroneous positive flocculation.

TAKATA-ARA TEST (CRANE REPORTED BY KIRK)4

One cubic centimeter of a 0.9 per cent solution of sodium chloride was pipetted into each of six small test tubes (agglutination tubes are very satisfactory). One cubic centimeter of the patient's serum was

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added to the first tube. One cubic centimeter of the patient's serum and saline solution well mixed was pipetted into tube 2, and the procedure continued until dilutions from 1:2 to 1:64 were obtained. The final cubic centimeter was thrown away. To each tube 0.25 c.c. of a 10 per cent solution of sodium carbonate was added, followed by 0.15 c.c. of 0.5 per cent mercury bichloride. The tubes were then shaken and were read in five minutes and again in twenty-four hours. A pearly flocculent precipitate filling at least one fourth of any tube and a definite precipitate in any of the first four tubes is considered strongly positive. All other types of precipitate or lesser degree of the pearly flocculent precipitate are considered negative.

MATERIAL

The serum tested in this report was obtained from patients in the Tulane Service of Charity Hospital, patients in the Southern Baptist Hospital, and from Junior medical students in Tulane University. The latter were considered to have normal liver function, and their serum used as a normal control.

INTERPRETATION

In an interpretation of the above results we have followed the suggestion of Hanger and considered 1 + reactions as negative, inasmuch as 13.8 per cent of the normal controls showed this type of reaction. Of the three positive cases occurring in the normal controls two gave a 2 +, and one, a 4 + reaction. These three positive reactions could not be explained by any clinical symptoms or physical findings referable to hepatic disorders. However, as the Takata-Ara test in all three was also positive, they warrant further investigation.

The miscellaneous and undiagnosed groups were chosen at random from cases showing no evidence of hepatic disorder.

In Groups II and III not all of the cases (see table 1) clinically showing liver damage gave positive cephalin cholesterol flocculations. There was one of hepatic cirrhosis proved at autopsy which gave only a 1 + reaction.

Noticeably three cases receiving sulfonamide drugs in toxic doses gave strongly positive flocculation in each instance.

Also of significance is the absence of a positive cephalin cholesterol test in two cases of pancreatic carcinoma with jaundice. Apparently the duration of the obstruction was not prolonged sufficiently to cause liver damage. On the other hand, the one case of cholelithiasis which had had jaundice for six weeks gave a strong flocculation.

In Group IV consisting of three cases of latent and two of central nervous system syphilis, two strongly positive and three negative reactions were obtained.

RESULTS

TABLE 1

CONDITION	NO. OF CASES	TAKATA-ARA Neg.	TAKATA-ARA Pos.	CEPHALIN-CHOLESTEROL (Neg. - 1+)	CEPHALIN-CHOLESTEROL (2+ 3+ 4+)
1.					
No Liver Disease					
Normal	29	26	3	26	3
Cholecystitis	4	2	2	3	1
Toxic thyroid	1		1	1	
Miscellaneous	20	18	2	18	2
Undiagnosed	13	7	6	13	
	67	53	14	61	6
2.					
Intrinsic Liver Disease					
Catarrhal jaundice	3	2	1	1	2
CPC of liver (H.C.V.D.)	8	7	1	7	1
Cirrhosis	6	2	4	4	2
Toxic (drugs) 1. Arsenic	1	1		1	
Toxic (drugs) 2. Sulfonamide drugs	3	2	1		3
Weil's disease	2	2		2	
Myelogenous leukemia	1	1			1
Pre-eclamptic	1	1			1
	25	18	7	15	10
3.					
Obstructive Jaundice					
Ca. head of pancreas	2	2		2	
Cholelithiasis	1		1		1
	3	2	1	2	1
4.					
Syphilis					
Latent	3	3		2	1
CNS	2	1		1	1
	5	4		3	2

CONCLUSIONS

1. In the 100 cases presented, the cephalin cholesterol test definitely agrees with the Takata-Ara in 90 per cent of the 29 normal controls and in a majority of the remaining cases.

2. Neither test is influenced by serum containing bile or having positive serology for syphilis.

3. The cephalin cholesterol test is a simple procedure provided the cephalin cholesterol reagent may be obtained. (In our series this reagent was donated through the courtesy of the Digestive Ferments Company, Detroit, Michigan.)

4. In our experience the cephalin cholesterol test for liver function is definitely of value, especially in jaundiced cases. One must keep in mind, however, that like other liver function tests it is not infallible.

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PRIMARY THROMBOSIS OF THE AXILLARY VEIN*

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It has long been a well-known and somewhat enigmatic fact that whereas postoperative or post-puerperal thrombosis occurs almost exclusively in the lower extremities, thrombosis associated with strain or effort almost invariably involves the upper extremities. It is perhaps equally significant that while the former may be considered relatively common, the latter is commensurably rare. This is clearly demonstrated by the fact since its original description by vonSchrötter,[84] in 1884, a careful survey of the literature reveals approximately 150 cases reported by almost as many authors. In this survey the paucity of the American literature on this subject prior to 1934 when Matas[58] published his characteristically comprehensive presentation, was a striking observation. With pardonable pride attention is directed to the fact that since then the overwhelming majority of reports have been by American authors.[101]

It is deemed inopportune to attempt here a detailed discussion of this subject since little factual knowledge has been added since Matas' exhaustive consideration.[58] However, it may be fitting to review briefly the essential features of the condition and to emphasize the diagnostic value of phlebography and certain therapeutic measures. Moreover, it is considered desirable to record the unusual experience of five cases in less than five years.

Primary axillary thrombosis occurs most commonly in the male and in the right arm and when the left side is involved it is usually in left-handed patients or those having exerted an unusual strain on this arm. Curiously enough while only a few cases[15, 17, 25, 27, 82, 93, 99] have been recorded in females, in the authors' series of five cases three were females. Whereas rarely it may develop spontaneously like a bolt out of the blue and without rhyme or reason, the patient finding his arm stiff and swollen on awaking,[51, 52, 55, 56, 71, 95] usually the condition is observed in "young, robust, muscular individuals" and follows some type of sudden or unusual effort or strain. It would seem that these forms of preceding muscular exertions vary considerably from sudden severe violent efforts to simple "banal" acts. Accordingly in some of the reported cases, the condition has followed such actions as controlling a wild horse,[83] moving heavy furniture,[6] pulling tents from trees,[85] and falling on the abducted arm.[45] The strain in others has been associated with some habitual occupation such as waiting at a table for a long

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period,[53] beating wash clothes,[82] and the sudden slipping of a wrench "while making a connection between metallic tubes."[58] In contrast to these rather violent, excessive, or sudden muscular exertions are such curious, mild, and simple efforts, so expressively termed "banal" by Matas, such as stirring a Christmas pudding,[27] cracking a whip, swinging a golf club, and pitching a baseball.[5, 53] Rarely cases are reported in which the condition develops as a complication of pulmonary tuberculosis,[11] influenza, [39] operation,[55] and polycythemia vera.[87]

While the exact etiology of this condition has not been determined, certain theories have been proposed to explain its mechanism of development. Of these the earliest is the traumatic theory originally advanced by vonSchrötter[94] who believed that the thrombus originated in a localized phlebitis produced by the sudden stretching and compression of the vein. Venous distention by respiratory effort was suggested as a contributing factor.[15, 45] This theory gained support by subsequent anatomic studies. On the basis of cadaveric dissections Lowenstein[53] showed that with the arm in the abducted position the axillary vein is indented by the costocoracoid ligament and the subclavius muscle. These observations were confirmed by Gould and Patey[33] who, by injecting plaster of paris into the axillary vein, demonstrated indentations corresponding to the position of these structures. They also emphasized the significant presence of a fairly constant bicuspid valve in the vein, the subclavio-axillary valve, at the level of the subclavius muscle. Accordingly they theorized that venous distention and stasis accompanying forced expiration and trauma and pressure of the subclavius muscle on the vein with the arm in the abducted position was sufficient to rupture the delicate valve and initiate thrombosis. Willan believed that thrombosis was initiated by injury consequent to stretching of the axillary vein between the clavicle and the first rib. Other variations of the traumatic theory have also been proposed.[71a, 85, 88] On the basis of roentgenologic and autopsy studies Veal and McFetridge[93-95] believe that the axillary vein is constricted not at the level of the subclavius muscle but against the subcapsularis muscle beneath the head of the humerus. While these various observations conceivably may be considered as predisposing factors, they do not satisfactorily explain the mechanism of primary axillary thrombosis in all cases. The inadequacy of the traumatic theory becomes readily apparent upon considering the cases of spontaneous thrombosis and those in which the preceding acts of "effort" or "strain" are so commonplace and trivial that were they significant in the precipitation of the attack the condition would occur frequently instead of rarely.

The theory of infection has been championed particularly by the French observers.[16, 30, 47, 48] In his perspicuous study of this condition Matas[58] directed attention to the obvious clinical and bacteriologic evidence that makes "the theory of an infectious traumatic phlebitis ---- untenable." Accordingly of seven cases in which the thrombus was removed and studied bacteriologically only three showed the presence of bacteria and in these there was an associated inflammatory reaction "not in conformity with the clinical history and termination of the great majority of these cases."

The sympathetic theory, more recently advanced by Cottalorda,[18] is based upon the assumption that the clinical manifestations are due actually to venospasm (usually but not necessarily associated with a thrombus) initiated by sympathetic irritation consequent to trauma. This theory is in accord with the views of Leriche[49] and the authors[13, 21, 22, 63-66] who have demonstrated clearly the presence of vasospasm and its significance in thrombophlebitis of the lower extremities. The theory also finds some support in the fact that a thrombus may not be present. Thus of 24 cases collected by Roelsen,[81] including three of his own in which the axillary vein was explored, 12 (50 per cent) showed no evidence of thrombosis. Further strength is

given this theory by the definite improvement observed in the authors' cases reported below by the release of vasospasm and the production of vasodilatation by novocain sympathetic block. Whereas other important factors are probably operative in the pathogenesis of this condition, it would seem that vasospasm plays a significant role.

The clinical manifestations of primary axillary thrombosis are usually quite characteristic. Several hours or days following some type of sudden muscular effort or trivial exercise of the arm the patient experiences slight or no pain but observes a rapidly spreading edema associated with lividity or slight cyanosis which within 24 to 48 hours reaches its maximum intensity. The entire arm appears markedly swollen and dilated superficial veins become readily apparent over the upper arm, shoulder and anterior surface of the upper chest wall (fig. 1). The temperature is usually normal and there are no local or constitutional evidences of an inflammatory reaction. A firm tender cord may be palpable in the upper arm and axilla, corresponding in position to the axillary vein. No significant or characteristic sphygmomanometric or hematologic changes have been demonstrated. There is an increased venous pres-

Figure 1. Infra-red photograph of case 2 showing numerous dilated superficial veins in upper arm, shoulder, and chest.

Figure 2. Phlebogram of case 3 showing marked dilatation of valves and distinct obstruction of axillary vein just distal to first rib.

Figure 3. Phlebogram of case 5 showing marked dilatation of valves, definite obstruction of axillary vein proximal to first rib, and numerous collaterals about shoulder and upper chest.

sure and a decreased oxygen saturation of the venous blood in the affected arm.[36]

The diagnosis is usually self-evident. The common history of some preceding "effort" followed by the rapid development of a markedly swollen cyanotic extremity and the conspicuous contrast between the striking local manifestations and the notably absent constitutional reaction forms a distinct clinical picture. While such conditions as substernal goiter and other mediastinal and intrathoracic tumors, aneurysms, cervical rib and scalenus anticus syndrome, regional infections and enlarged lymph nodes, syringomyelia or other central or peripheral neuropathic disorders, and fractures should be included in the differential diagnosis, usually there is little reason for confusion. However, in cases of doubt the procedure of phlebography has a definite diagnostic value. This consists essentially in the roentgenographic visualization of the venous radicles of the involved extremity following intravenous injection of a radio-opaque substance. By this method of study it is possible to demonstrate clearly the site of obstruction in the axillary vein and the extent of involvement as well as the patent collateral venous channels (figs. 2 and 3). While thorium dioxide has been used for this purpose, diadrast is considered safer and just as satisfactory.

In the majority of cases the prognosis, both as regards life and subsequent morbidity, has been good. Whereas pulmonary embolism occurred in two cases,[59, 83] only one was fatal and, as emphasized by Matas, this case cannot be legitimately classified as primary axillary thrombosis by effort. The duration of disability varies considerably, although in many cases complete restoration is effected within several months. In some individuals, residual symptoms may persist for years and in others subsidence of manifestations may be followed by recurrence on resumption of former occupation. This is clearly demonstrated by Matas' cases in which recurrences persisted for three years and by that of Jeanneny and Mathey-Cornot[40] in which relapses persisted for six years.

Two forms of therapy, conservative and radical, have been employed. The conservative measures consist essentially of rest, immobilization and elevation of the extremity, application of compression bandages, and physiotherapy. These measures have as their purpose the relief of edema and the development of an adequate collateral circulation. However, if consideration is given the sympathetic theory, and there is good evidence for this, such measures are obviously inadequate. For this reason novocain sympathetic block of the stellate ganglion according to the technic previously described by the authors[62] was employed in five of our cases. The rapidity of improvement and restoration of function and the absence of recurrence which followed this method of therapy seem to indicate its rational value.

The radical procedures consist of thrombectomy,[7, 9, 46, 83] excision of the thrombotic segment,[16, 18, 23, 30, 37, 69, 72] and multiple incisions[98] and needling. These last procedures are used with the purpose of more rapidly relieving the edema by permitting discharge of the tissue fluids. This seems a rather drastic measure for it invites infection and other unnecessary complications. Thrombectomy or excision of the thrombosed venous segment appears to have a more rational basis. These procedures are based upon the concept previously elaborated in the discussion of the sympathetic theory. According to the reported cases the results would seem to justify their employment. For this reason if under conservative management symptoms persist or recurrences develop, operative intervention and the excision of the thrombotic venous segment should be performed.

SUMMARY

1. Primary thrombosis of the axillary vein occurs relatively rarely although a careful review of the literature since Matas' exhaustive consideration of the subject indicates its more frequent occurrence. This is further revealed by the authors' un-

CASE REPORTS

Case	Date	Sex	Age	Occupation	Cause	Arm	Clinical Findings In Arm	Associated Conditions	Venography	Treatment	Course
1. W. S.	3/28/41	M	37	Timekeeper	Sawing tree-limb overhead	R	Swelling, lividity, impaired function. Palpable axillary cord. Dilated superficial veins.			Sympathetic block. Elastic bandages.	One yr. later complete recovery.
2. J. H. M.	4/18/41	F	66	Housekeeper	Spontaneous	L	Pain, slight swelling, limited motion. Dilated veins. Tender palpable axillary vein.	Hypertensive cardiovascular disease. Aur. fibrillation.	Showed obstruction of axillary vein.	Elastic bandages.	Improved
3. M. H.	11/28/41	F	15	Schoolgirl	Beating time with baton	R	Swelling, lividity, limited motion. Dilated veins. Tender axillary cord.		Obstruction of axillary vein to 1 cm. of first rib.	Sympathetic block. Elastic bandage.	Three months later complete restoration.
4. A. B. B.	12/16/41	M	54	Carpenter	Sawing wood	R	Swelling, lividity. Pain. Dilated veins, axillary cord palpable but not tender.	Attack of influenza.		Sympathetic block. Elastic bandage.	Immediate improvement. No follow-up.
5. C. M.	1/5/42	F	16	Schoolgirl	Spontaneous	R	Swelling, lividity, fatigue, dilated veins. Axillary cord not palpable.		Obstruction of axillary vein to within 2 cm. of first rib.	Sympathetic block. Elastic bandage.	One month later almost complete restoration.

usual experience of five cases in less than three years.

2. Whereas the condition may develop spontaneously, it usually occurs in relatively young, healthy, muscular individuals following some type of sudden or unusual effort. It most commonly affects males and involves the right arm.

3. The exact etiology of the condition is unknown but three theories, which may be considered as traumatic, infectious, and sympathetic, have been proposed to explain its mechanism of development. These are briefly reviewed and critically analyzed.

4. The characteristic clinical features of the condition are described and consist essentially of a brawny edema and slight cyanosis of the entire arm associated with dilated superficial veins over the upper arm, shoulder, and anterior surface of the upper chest wall. The striking local manifestations form a distinct contrast with the notably absent constitutional reaction.

5. The diagnosis is usually self-evident. In cases of doubt the simple procedure of phlebography has a definitive diagnostic value.

6. The prognosis both as regards life and subsequent morbidity has been good in the majority of cases.

7. Treatment may be conservative or radical, the latter being indicated for those cases which do not respond satisfactorily to the former. Attention is directed to the value of novocain sympathetic block as employed in the authors' cases.

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DISCUSSION

Dr. Matas (New Orleans): This excellent paper illustrates, as the authors say, the remarkable increase in the reported cases of the so-called primary thrombosis of the axillary vein by strain. In 1934, when I had occasion to call attention to this lesion, a careful search of the American literature showed that there were scarcely more than seven reported cases. Yet, in the short period of the eight years that have intervened no less than fifty or more cases have been added to the reports from this country. But even when we realize the extraordinary increase, the fact that Dr. DeBakey and his associates are able to report five more authenticated cases in less than five years within the sphere of their own personal observation is, in itself, a striking example of the well known fact that many diseases and many symptoms or signs of disease, previously unrecognized or deemed rare, suddenly spring out of the obscurity in which they have been submerged when their distinct individuality and unsuspected importance is recognized. It is probable that even now we would not be giving so much attention to thrombosis of the axillary vein caused by effort or strain, were it not that it has become an important cause of litigation for compensation and indemnity.

Despite the vast amount of writing that has accumulated in the literature of this lesion in recent years and the ingenious theories that have been evolved to account for its strange peculiarities, especially its polyvalent origin,—its disabling reactions to seemingly insignificant causes—and its preference for the veins of the upper extremities is still a mystery that justifies the attention given to it. How to account for such disabling effects from such trivial and insignificant causes is not clear, but makes one think of some latent thrombophilia which predisposes to venous thrombosis, just as the victims of thrombopenia are made especially liable to hemorrhage from seemingly trifling causes.

While much can be done to relieve these patients by treating the individual according to special etiologic and symptomatic manifestations, I believe that in addition to the constitutional indications in dyscrasic patients (for example, colchicum for the gouty), that the best results may be expected from prolonged and complete immobilization of the upper extremity in a plaster casing to include the hand, whole arm and chest. Blocking the stellate ganglion with novocain, as proposed and practiced by the authors, is justified and worthy of trial in experienced hands; but in dealing with a capricious entity as this, it is difficult to make a definite estimate of its value on the basis of the present evidence.

The differentiation of the traumatic from the so called spontaneous cases still remains the outstanding medico-legal question before the Bar and the jury in compensation and indemnity cases.

Dr. Gage (New Orleans): I have enjoyed Dr. DeBakey's presentation for two reasons: I have been interested first, in the syndrome designated as effort thrombosis, and second, in the methods developed in the Department of Surgery of Tulane and the Ochsner Clinic for its treatment and cure.

I have seen several of the cases of effort thrombosis of the axillary vein and have been impressed with the nominal trauma and the extensive pathologic physiology resulting therefrom. The first venogram here was done on a case on the independent service at Charity Hospital by Dr. Veal at my suggestion. In this case the patient slapped at a mosquito during the night and the next morning his right arm was about twice the normal size. The venogram in this case demonstrated a complete block of the axillary vein.

Dr. DeBakey has had several of these cases and in each, venographic studies have invariably demonstrated a block (thrombotic) of the axillary vein.

I think we all are cognizant of the beautiful experimental investigations on thrombophlebitis and phlebothrombosis and their clinical applicability that emanated almost entirely from Tulane's Departments of Medicine and Surgery. These experiments unquestionably demonstrate that vasospasm plays a definite role if not in its etiology, a contribution to its progressiveness and persistance. This certainly is proof here tonight that following the removal of sympathetic inhibiting influences there results a rapid subsidence of the edema and a return to normal.

The etiology still remains obscure, but the resulting pathology is now thoroughly understood and is relievable by the methods advocated.

I saw a rather interesting case which is very rare. A patient in his early fifties who has this effort syndrome (thrombophlebitis) which was confined to his right lower extremity. He was an insurance collector and after a strenuous day's walking he retired only to find in the morning that his right leg was about half larger in size than normal. He deserted the hospital and did not return. Therefore, we were unable to investigate his case thoroughly. However, from his history, I feel positive that this was an effort thrombosis of his femoral vein.

I believe that we should investigate the lymphatics in these cases because I feel that single thrombosis of the axillary vein is insufficient to produce the clinical picture. We know of many cases in which the axillary vein is occluded and there is no resulting edema. But in these cases thrombosis of the vein results in an extensive edema that is hardly compatible with single occlusion. As anomalies of the cervical lymphatics are not infrequent, and as the supra-clavicular axillary and upper extremity lymphatics have a common origin from the cervical jugular lymphatic system, it is possible that in these cases there is a congenital malformation of the lymphatics. If this be true, it would help to explain the extensive edema that always is associated with this syndrome. We all are cognizant of the difficulties of producing edema by vein occlusion and that it is absolutely essential to produce perivenal lymphatic obstruction concomitantly with venous occlusion to produce marked edema in the limbs of experimental animals. Accordingly it would be desirable to investigate the lymphatics in all future cases.

SYMPOSIUM ON HEALTH PROTECTION OF CIVILIANS IN THE PRESENT WAR*

NUTRITION

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"Food will win the war." This was the slogan of World War I that transcended all of the many slogans that were in those days employed to stimulate, to interest and to educate the peoples of the United States. This probably was as true a slogan as any of the many that were coined at that time because certainly the collapse of the Central Powers was due more to the inadequacy of the food supply amongst the civil population, than any other one factor. In the war days of 1914-18 food was thought of in terms of calories and not as substances which contained vitamins and minerals, requisite and necessary for good health. While it is true that the average German lost weight during this time of strife, actually few, if any, Germans truly died as result of starvation but they did suffer from chronic ill health as result of the incompleteness of their dietary ration. Their ill health in turn begot mental depression, physical weakness and inability to accomplish the work necessary to keep the soldiers at the front supplied with arms and munitions. The downfall of Germany in 1918, which still had many millions of trained soldiers, was an internal collapse and undoubtedly it was the result of improper feeding of the population over a period of years. Subnutrition accounted for her overthrow more than any other one tangibility.

The Germans of today are not going to permit the same series of events to develop during the present war. Actually while the generation that lived during the war, and the one immediately after, still show the effects of their malnutrition, the present day young German is a splendid physical specimen. Shirer contrasts the appearance of some British prisoners taken by the Germans in Belgium with the German infantry. He writes—"I could not help but comparing them with those British lads. The Germans, bronzed, clean-cut physically, healthy looking as lions, chest developed and all. It was part of the unequal fight." Wilder[1] mentions the experiences of an American woman who was caught in southern Germany when Hitler declared war. He quotes her as saying that she had never seen such men—"Tall, broad shouldered, straight

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backs, clear skins, lustrous hair, bright eyes"—they must have looked like young Vikings. It is said that this physical development of the young Germans has in good part been the result of the Germans' emphasizing the science of nutrition. The first ten years after the war the rejections of the German army were high as has been our experience with the Selective Service but they, the German youths, since then have been put on a diet which is adequate in every respect. The Germans have made use of every bit of food material that contains minerals and vitamins, as well as calories, but the first two elements have been particularly accentuated and stressed. The Germans are not only using all their available food material but also they are making use particularly of synthetics as well as those things which are considered waste products, in order to obtain additional minerals and vitamins. They even grind up the bones and use the powder as a supplement to the civilian and Army ration. They provide fat by collecting some 1,500,000 kilograms of kitchen waste every day to feed to hogs which in turn supply vitamin A as well as other vitamins. Their bread is made from flour of whole grains, their noodle dough is supplemented with cabbage, spinach, carrot and onion juice; vitamin C is also fed in tablet form. They are said to have manufactured as a reserve for future use 100 tons of synthetic ascorbic acid.

All this is said not to laud or to compliment the Germans; far be it from me to do this, but I cannot help feeling that the people of this country are looking back upon the experiences of the past war and feel that there will be a collapse of Germany sooner or later because of the economic blockade and because the Germans cannot obtain proper nourishment. The fact must be faced that we are engaged in a war with an enemy which is physically and mentally tuned up as no nation has ever been in the past. We have to face facts and we have to put our own house in order.

The evidences of nutritional deficiencies in this country at the present time are striking. Major Rizzo,[2] in a recent address, points out how many of the selective service men were deferred or completely turned down on account of nutritional disorders and more particularly on account of horrible mouth conditions. This is particularly true of certain portions of Louisiana. Fifty-four per cent of the registrants in southern Louisiana who were disqualified in the early draft examinations, were disqualified because of faulty dental states. However, for the state as a whole the average was 27 per cent and over the entire country it was slightly under 21 per cent. Granted that draft standards were high, nevertheless it definitely points to the fact that these people of southern Louisiana have been living on an inadequate diet and one that lacks vitamins A, C and D, as well as calcium and phosphorus.

A most graphic evidence of widespread malnutrition in the State of Louisiana may be obtained from a recent survey made by the Louisiana State Board of Health at the request of Dr. John M. Fletcher, chairman of the Louisiana Educational Survey Committee.[3] Children were studied in seventeen parishes scattered throughout the state as to their nutritional status. It was found that only 60 per cent of the white children could be considered to have excellent or good nutrition, whereas 40 per cent had fair, poor or very poor nutritional states. It is only right to say, however, that of this latter group approximately 70 per cent could be classified as having fair nutrition. Nutrition was notably poor in the children in the lower grades. For example, of 230 children in grade one, 127 of them would be considered as malnourished, or 55 per cent. It is true that this sampling of the school population is not large enough to be statistically important but it is at least highly suggestive.

The most widely quoted figures as to national malnourishment and the ones which led to the calling of a national conference on nutrition in Washington a year and a half ago are those which were compiled by Stiebeling and Phipard[4] who found that in a study of the expenditures for food of individuals living in eight different geographi-

cal areas in the United States who were wage earners and low salaried clerical workers, that about half of the people were living on poor diets. On the basis of this observation the pronouncement has been made that 45,000,000 people in the United States are malnourished. I do not think for a minute that these figures are accurate. I cannot possibly conceive of so large a number of our citizenry suffering from undernourishment. But the Selective Service figures, these figures of Stiebeling and Phipard and certain nutritional studies, would indicate that there are large sections of the population of this country who are undoubtedly suffering from subclinical deficiency. This is a very important problem of our national defense. Four years ago in the section on nutrition of "Internal Medicine" I[7] wrote on chronic dietary deficiency, pointing out that while frank expressions of avitaminosis are extremely uncommon, chronic dietary deficiency—"the malnutritive state characterized by a group of nonspecific symptoms and signs arising from a deficiency in the diet of any or theoretically all of the essential food factors is extremely common." Such people are lean, they have dyspepsia, and headache, loss of appetite, they are irritable, suffer from vague pains and aches, and above all, those symptoms of importance at the present time, fatigue and weakness and mental depression are paramount. There is a host of evidence that can substantiate these statements. For example, Williams and Mason[5] have shown that emotional stability is impaired, and mental and physical efficiency are markedly lowered as result of thiamine restriction. It is well known at the present time that dental defects, skeletal abnormalities, anemia, underweight, functional gastrointestinal symptoms are the direct result of an inadequate, improper or carelessly selected diet. Are not the shiftlessness and laziness of many of our poorer crop-sharing tenants of the South due to the economic cause of a limited income which prevents them from buying foods which will contain thiamine, nicotinic acid, ascorbic acid and calcium? It is known that the income of 4,000,000 families in this country is less than $500 a year, that 27.5 per cent of the remainder live on an income of less than $1,000. These small incomes include not only actual money values but also the equivalent of income from what is grown on the land. Certainly the budget of one of these poor families does not provide enough nor can it assure adequate food for the children or for the adults.

Wilder, the chairman of the Committee on Food and Nutrition of the National Research Council, has presented the facts of the case in a masterly article recently published in the Journal of the American Dietetic Association which I would suggest that those of you interested might read with great profit. In the same number of this journal is an article by Mitchell[6] of the Health Defense and Welfare Services in Washington. Her suggestions to remedy the present condition of affairs which would certainly mitigate against our fullest efforts in defense are stimulation, information and application. By stimulation she recommends that every citizen should be stimulated to obtain his optimum health and well being; by information she stresses the importance of education and of teaching people concerning food values and human nutritional requirements; and by application she calls for the cooperation of both the farmer, distributor and consumer, the farmer to raise proper kinds of food, the second to distribute the foods in proper physical condition and the latter to apply nutritional principles in meal planning.

The suggestions of Mitchell[6] are of course splendid in every respect but specifically it seems to me that there are two or three objectives that the doctors of Louisiana can seize upon in order to forward the movement to bring about nutritional efficiency in their clientele. First and foremost is the building up of the youngsters and for the time being until the parents are properly educated or have sufficient funds this best can be accomplished by proper school lunches. This point cannot be stressed too strongly because many a poor child receives the greater part of his calories and the best

part of his vitamins and minerals in the school lunch. For the most part these school meals are selected with intelligence, tastily prepared and greatly enjoyed by the children. A parochial school in which I happen to be interested is materially aided by the food stamp distribution of the Government. A Friday meatless luncheon consists of rice, red beans, the sauce of fresh tomatoes; it is supplemented by chocolate from dried milk, by whole wheat bread, by marmalade and fresh apples, nearly all of these foods being supplied by the surplus commodity corporation on the stamp plan.

The next is the importance in advising the farmer to raise protective foods. Too often the small farmer is a one or two crop man and will not raise grains and fruits, will not have a cow or a pig and often not even an egg-laying hen.

Lastly I would suggest the whole hearted endorsement and active propagandizing by the medical profession of the use of fortified bread. Bread is a staple which makes up a goodly portion of the calories in the average dietary. White bread is totally inadequate in minerals and vitamins. The fortified bread contains additional vitamins and minerals added in part from artificial sources and made up in part by the minerals and vitamins which have not been removed by the process of milling the grain. I cannot come to the end of my talk without saying a word or two about pasteurization of milk. Milk is the most important ingredient in the young person's diet. Yet one hates to stress the importance of this food and the necessity of its being incorporated in the diet without a qualm of conscience that the milk may not be safe milk. If pasteurized, it can be drunk with confidence and recommended by the physician, without the fear that it will be responsible for a milk-borne disease.

SUMMARY

The people of the United States need have no worry about the quality of food provided their soldiers and sailors. It is ample in amount and adequate in quality. They do need to worry, however, about the people behind the soldiers—the future soldiers and those who are engaged in the many activities of national defense who cannot function efficiently and give their best efforts to supporting our armies in this world-wide war without their receiving food which will ensure good health, both physical and mental.

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EMERGENCY WATER SUPPLY AND SEWAGE DISPOSAL

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Modern war is total war. This statement has been made so frequently during the past few years that there is danger that many will come to consider it trite and unimportant.

Formerly, civilians were supposed to get out of combat areas. Today, the possessions of belligerents—and, too frequently, the country of those who would be neutral—lie within the theater of war, and the enemy strikes hundreds, even thousands, of miles from actual combat areas.

Today, the Battle of Production has attained an importance greater than ever before, and no community which produces anything of importance to our war effort, and there are very few which do not, can consider itself free from the danger of enemy attack either from within or without, from sabotage or from air raids.

It is this threat of harm which constitutes a general emergency at present.

The protection of public water supplies, furnishing an adequate supply of safe water

for drinking in case of failure of the public supply, and providing means for proper disposal of body waste constitute some of the most important problems of civilian defense.

Water is essential for the maintenance of life. Contamination of water and food by war gases may result in casualties or even death; and contamination of water by sewage is the means of spreading typhoid fever, dysentery and other enteric diseases.

Water is essential for fighting fires. The incendiary bomb is one of the chief weapons of the enemy air force in attacks on cities, and some reporters have stated that fire has caused the greatest damage to property in England during the period of bombing.

One sort of food may be used in place of another kind, various types of transportation may be used, repairs may be made to damaged structures, but there is no substitute for water, and all too frequently it is impossible to repair loss and damage which may be caused by gas contamination and the lack of sanitation.

The affair at Pearl Harbor was a rude awakening to those who believed that "it cannot happen here." It did happen there, and it can happen here.

We hope for the best; but we should plan for the worst and should prepare to implement our plans according to needs as they develop. Some enthusiasts for preparedness have caused expenditures of effort and of materials which might have been used otherwise to greater advantage. On the other hand, failure on the part of some to distinguish between planning and the making of actual preparations has delayed needed planning on the grounds that money for materials should not be spent until the need is real and acute. Planning takes time, and we cannot buy yesterday. We should plan now and we should not delay too long the making of preparations.

For what should we plan? For sabotage, all out raids, occasional raids, or token raids? For sabotage, definitely, yes! It seems too soon yet to expect all out raids or occasional severe raids; but those who should know say that coastal cities may expect token raids.

Sabotage may be undertaken to break down morale or, more probably, to cause such damage as would interfere with military effort, or the production of military supplies. Protection of water supplies against sabotage is a matter of considerable importance, and is primarily a matter of vigilance and of providing some extra precautions.

During the present war, as during the last war, few acts of sabotage against water supplies have been reported from Europe, but conditions in the United States and its possessions are different. American authorities consider that the protection of water supplies against sabotage is a matter of prime importance.

The State Board of Health has been active in this matter for the past year. It was discussed at the Short Course for Water Plant Operators, held in Baton Rouge last June, and the Engineering Division, through its regional engineers has been advising local officials of this need in connection with our routine inspections of public supplies. At present an intensive program is under way to develop adequate protection for supplies at key points.

There has been some discussion in newspapers and technical journals of the possibility of danger to water supplies by the introduction into the supply of pathogenic bacteria or of war gases or other poisonous materials.

While the possibility of contamination by pathogenic bacteria must be borne in mind, the danger seems remote. Those familiar with bacteriologic procedures can visualize the difficulty of dealing with the large volume of cultures which would be necessary to get results, and, furthermore, treatment processes in general use would be effective in eliminating the bacteria.

It is extremely improbable that a sufficient amount of toxic material could be placed in a water supply reservoir to give a harmful concentration. However, even a slight contamination, sufficient to scare people, would be of importance since it would cause a number of persons to use

other sources of supply which might not be safe.

So far in the present conflict we have no accounts that any water supply has been intentionally polluted by the saboteurs or by enemy action. With the exception of a few Japanese attacks in China and Malaya, no gases have been used in military action. The attacks upon the smaller European nations did not include action against water supply other than that related to direct military action. England has reported no water supply sabotage problems.

Nevertheless, this form of attack is a possibility and we should organize for defense against any and all forms of attack. The Japanese did make a definite and successful attempt to cut off the sources of supply of Hongkong and Singapore which were some distance from the cities.

In a recent article by an Army Officer, it is stated that for the past several years the Army Medical Corps, the Sanitary Corps and the Chemical Warfare Service have been working together on a study of this problem. Methods have been developed for the removal of contamination due to war gases by means of the usual water treatment plant equipment with relatively slight modifications of usual filtration methods. Where filters are not used, removal is possible but more difficult. Safe limits have been determined for various toxins and gases, and relatively simple quantitative tests have been developed to determine their presence.

In this country, the greatest damage to water supplies from enemy action is likely to come from bombs delivered by aircraft. This danger may seem remote, but we must prepare to meet it.

Let us consider briefly the effect of bombs. Bomb crater sizes depend on size of bomb, nature of material hit, and length of time fuse. A distance of 20 feet may be considered as an average diameter of a bomb crater. Average penetration distances are: for a 100 pound bomb, 11 feet; for a 500 pound bomb, 15 feet; and for 1,000 and 2,000 pound bombs, 22 to 25 feet. A 1,000 pound bomb dropped from 20,000 feet in clay soil will penetrate from 30 to 40 feet.

Where a 2,000 pound bomb explodes, pipes and sewers 65 feet distant invariably are broken; where a 3,500 pound bomb explodes the distance would be 75 to 80 feet; and, depending on the nature of the soil, the earth shock may break sewers and cast iron pipes at even greater distances.

Approximately 25 per cent of bombs fall in streets where they may affect water and sewer pipes. As many as 20 breaks in one night have occurred in some raids. It is estimated that the water department must be prepared to repair one break in each size pipe in each 10 square mile area.

Even though the water and sewer pipes were not laid in the same trench, about three-fourths of the streets in built-up areas contain both water and sewer pipes. The craters are usually large enough to include breaks in both, and the crater promptly fills up with a mixture of sewage and water, resulting in contamination of the broken water main. Hypochlorites are used liberally to disinfect mains as they are repaired, with dosages varying from 10 to 50 ppm free chlorine. Special attention is given to removing any solid material which has entered the pipe while it was broken. Stirrup pumps are used to force hypochlorite solutions into mains through hydrants.

Since the outbreak of war the Ministry of Health has ordered the sterilization of all drinking water and, owing to its low cost and ease of application, chlorination is universal. (In the United States all surface water supplies and many ground water supplies are chlorinated.) Some authorities in Britain maintain a residual chlorine content throughout the system, some increase the dosage during enemy action, risking chlorine taste troubles in the interest of security. Complaints are said to be few since the people have learned that a chlorine taste is an indication of safety. A residual chlorine content throughout the entire distribution system is an excellent safeguard, and the use of such a method has been recommended by some people in this country.

However, the Board of Directors of the American Water Works Association, after a thorough study, has disapproved this practice as a general requirement. It is not practicable under many conditions, or necessary. The Board has recommended in lieu thereof certain other procedures.

Pending repairs to broken mains in "blitzed" areas, it is necessary to deliver water for potable purposes in tank trucks or other containers. From 20 to 30 gallons per household are allowed in London.

The British feared that with the inevitable damage to water mains and sewers by bombing, there would be a considerable increase in typhoid fever. Fortunately this has not happened. In London, for example, it is reported that every type of water pipe has been broken in all sorts of ways,that broken sewers have discharged their contents into broken water mains and thus spread pollutional material over long distances. Thousands of breaks have occurred; one main 4 feet in diameter has been broken at least eleven times. There have been paratyphoid outbreaks traced to contaminated food, but Sir Wilson Jameson, Chief Medical Officer of the Ministry of Health, London, England, has stated that neither in London nor elsewhere has there been any outbreak of typhoid fever due to damage to water mains and sewers as a result of air raids.

When there is imminent danger of air raids, water should be stored on the premises for drinking and for putting out incipient fires and incendiary bombs. Drinking water should be kept in bottles or other tightly closed containers. Water for washing or for fighting fires may be stored in barrels, buckets or other containers. In this section of the country such containers should be emptied and refilled weekly, or should be treated to prevent mosquito breeding. Addition of borax in the proportion of 2 ounces of borax to five gallons of water provides a simple and effective method of control.

One of the bulletins issued by the Office of Civilian Defense recommended that at the sound of an air raid warning bath tubs, barrels, and other containers be filled with water for fire fighting. This is dangerous advice. If followed, it would double the normal rate of demand and would cause a serious reduction in water pressure just when the fire department needs plenty of water under good pressure to fight fires caused by the air raids.

Sometimes, in an emergency, flood or drouth, or when the public supply is damaged, it is necessary to use water from springs or wells which may be unsafe, or at least not known to be safe. Under such circumstances, the water should be sterilized before being used as drinking water. Some methods of sterilizing water in small quantities are given here:

Boiling: Boil for two minutes if fuel is available.

Chemical treatment: Hypochlorites are the most readily available and effective chemical agents.

Chloride of lime, HTH, perchloron: A stock solution may be made by adding one teaspoonful of chloride of lime (containing 24 per cent available chlorine) to one quart of water. This stock solution should be kept in a well stoppered bottle. One teaspoonful of the stock solution is added to two gallons of water. The water should be thoroughly mixed and allowed to stand for a period of 30 minutes. After this time, the water will be safe to drink. If a chemical containing a larger percentage of available chlorine is used, a proportionate amount should be used in making the stock solution.

Zonite: A disinfectant usually available in drug stores. Add 10 drops of Zonite to a gallon of water and let stand one half hour before using. Seven teaspoonfuls of Zonite will disinfect 50 gallons of water.

Liquid hypochlorites: There are a number of laundry bleach solutions in grocery stores, and of disinfectants sold by dairy supply houses, which contain, usually, 50 per cent available chlorine (the strength of the solution is stated on the label). Two drops of these solutions added to one gallon of water are sufficient to disinfect waters not too badly polluted.

Iodine: Add four drops of tincture of iodine to one gallon of water. Mix thoroughly and let stand at least one-half hour before using.

The possibility of sabotage against sewerage systems must not be disregarded. The same principles which apply to the protection of water supplies apply to the protection of sewerage systems. It is most important to investigate carefully the history, background and loyalty of every employee.

Sewerage systems are particularly vulnerable to air attack, as may be noted from the previous discussion of the effect of bombs and from the fact that sewers are generally made of vitrified clay, not of metal pipe. Of course, all parts of the system are not equally vulnerable. Little can be done to protect against air attack, except to provide means for prompt repair to damaged parts of the system in order to restore service promptly. Experience in Great Britain has developed much interesting information on ways and means of dealing with emergencies, but the details would be more interesting to engineers than to physicians.

The disposal of human wastes where a sewerage system is not available, or where the water supply is temporarily out of service presents a problem for which there is no wholly satisfactory solution.

In refugee camps, where sufficient area can be obtained, pit latrines properly constructed and properly maintained are satisfactory. We have had considerable experience with these in Louisiana, in camps for refugees from flooded areas.

Chemical toilets may be used in air raid shelters. In urban areas temporary latrines may be set up over sewer manholes, or over shallow post holes dug in the back yard where it is large enough. In some sections of Great Britain scavenger services similar to our garbage collections were set up, and the material carried out of town and buried or dumped into rivers. Liberal use of disinfectants will assist in minimizing nuisance and spread of infection. We are informed that cooperative studies are being made by federal agencies and paper manufacturers to develop a watertight paper bag which can be placed within the toilet seat, used as a container and then disposed of through the regular garbage collection system or a special scavenger service.

POTENTIAL EPIDEMICS IN LOUISIANA

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In considering potential epidemic diseases in Louisiana under war conditions, it is impossible to dismiss the subject by stating that our present level of personal hygiene is relatively high and that our public health control of disease in this state is both adequate and competent to care for potential epidemics. Even though these statements may be relatively accurate, we have as yet in no essential way experienced the hardships or effects of total war efforts. Probably today as never before in our history the average individual or family of low economic level is well-nourished, well-clothed, works less than a third of his time and gets plenty of recreation in his motor car which for several months more will still keep rolling along. But within two years our eating will most probably be qualitatively restricted; much of our clothing will be threadbare and not necessarily adequate for cold, wet winter weather; we will be working many more hours a week, our recreation will be greatly reduced, and our nerves frequently on edge. These several factors will combine to effect a greatly lowered threshold of resistance to the pathogenic organisms which may be transmitted and may become greatly enhanced in their virulence by more rapid passaging through a more susceptible population. Moreover, we must be prepared not only for the diseases at present within the confines of Louisiana or the United States, but for more virulent types or strains, including exotic infections of the Tropics, brought back by troops which have seen service in hyperen-

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demic areas. This is the sanely pessimistic prospect which must be faced.

What types of diseases might possibly develop to epidemic proportions within the confines of our state? They may be epidemiologically classified as: (1) those carried by water, food and flies; (2) those primarily of the respiratory tract, and (3) those which are insect transmitted.

Water, food and flies: Today our water supplies are intact. No demolition bombs have fallen on the water filtration plants. Our sewage disposal is uninterrupted and is not now overtaxed. Thus, at the present moment, there is no probability of a major water-borne epidemic. Should any one of these sanitary facilities fail, we might expect an epidemic of typhoid fever, amebiasis or bacillary dysentery of considerable proportions. Should cholera be introduced into our area from abroad, the situation would be grave indeed, since few physicians in Louisiana are today experienced in the recognition and treatment of cholera. Moreover, if food at present condemned as unfit for sale should of necessity be sold and eaten, an additional danger would exist. If garbage collection should be reduced in our urban communities, and flies breed in great numbers around homes and in food markets, a serious supplementary danger would be provided, for it has been proved that filth flies may make a major contribution to the development of epidemics of amebic and bacillary dysentery, typhoid and cholera. Today 10 to 20 per cent of the population of Louisiana harbors the organism of amebic colitis, which for the most part exists in an inapparent or carrier condition. Likewise, mild chronic bacillary dysentery is by no means rare in this state, and typhoid occasionally develops in small groups. Reduced resistance of the population and greater exposure resulting from contamination of water, food and flies will unquestionably increase clinical manifestations of these endemic enteric diseases.

Respiratory diseases: Greater exposure and lessened resistance to infection will materially increase the likelihood of influenza and pneumonias, as in World War I. Moreover, pulmonary tuberculosis has already produced a considerably enhanced morbidity rate in European countries which have been engaged in total war efforts. How can we expect to escape these repiratory infections?

Insect-borne diseases: Today, within the borders of our state there are malaria, rodent flea-transmitted typhus, and tick-transmitted relapsing fever. Not far removed to the northwest are the apparently nearest rodent foci of plague and tick-borne Rocky Mountain spotted fever. These disease entities are now either mildly endemic in Louisiana or are outside our state. Nevertheless, malaria covers a considerable part of our state, and murine typhus has developed into an ever increasing health problem since it was first recognized in Louisiana in 1930, fifty years after the last recorded case of classical louse-borne typhus in Louisiana. These are conditions existing in peace-time.

Yellow fever has been absent from Louisiana since 1905 and dengue since 1923, but the transmitter of both, *Aedes aegypti* (the *Stegomyia* of former years), today breeds prolifically in jars and pots in yards and in cemeteries, and the population is probably 90 per cent susceptible to yellow fever. Should infected *Stegomyias* or incubating human cases reach New Orleans by airplane from endemic foci in Brazil or Colombia, an epidemic considerably greater than those of 1897, 1898, or 1905 might be anticipated. What provisions are we taking in our state to prevent an outbreak of yellow fever or dengue?

Epidemic encephalitis, which is transmitted by several species of mosquitoes in the United States, may potentially develop to epidemic proportion in Louisiana as it has in relatively recent years in St. Louis and on the East and West Coasts. Sporadic cases actually have appeared within recent months in our state, suggesting a reservoir of undiagnosed mild cases, from which an epidemic might readily spring. Since this disease may be transmitted by wild as well as domestic species of *Aedes* and *Culex* mosquitoes, Louisiana, like New Jersey, would

constitute an essentially unprotected area should these viral infections get out of control.

Unquestionably many cases of chronic tropical malaria will be brought into Louisiana within the next few years by returned troops. What preventive measures are we setting up to keep these virulent tropical strains from becoming established in our malaria mosquitoes in Louisiana?

In one respect we may feel fortunate. The relatively light-weight clothing of our population, lacking heavy cotton or woolen underwear, keeps human louse infestations down to a minimum, confined primarily to indigent transients. But in homes for transients, measures should be instituted, as in the Charity Hospital in New Orleans, to disinfect the clothing of all sojourners on their admission to these homes. Otherwise, louse-borne epidemic typhus and relapsing fever may conceivably develop in these homes of refuge, just as these diseases have assumed epidemic proportions in comparable groups of the population in other countries ravaged by war or famine.

Finally, thousands of defense workers are migrating into Louisiana. Many of them will live in congested quarters, many will be ignorant of our health codes, many will be particularly susceptible to diseases endemic in Louisiana. This group will constitute a special health problem.

The picture which has been presented is relatively dark, but it is not hopeless by any means, provided we are aware of the potentialities of epidemics and take effective measures to prevent them. Let us not say "It can't happen here!"

PREVENTION OF COMMUNICABLE DISEASES UNDER WAR CONDITIONS WITH ESPECIAL REFERENCE TO IMMUNIZATION

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New Orleans

If we knew what the future would hold with respect to the prevalence of communicable diseases during the remainder of this war the subject could be dealt with in a more satisfactory manner. In the absence of this knowledge we can only look abroad and observe the experience of other nations, especially England, whose health condition is more nearly parallel to ours than that of any other country, and look back to our experience in World War I. So far as available information goes, we find nothing especially to alarm us. Judged by the published reports the health situation in the British Islands has seemed quite good and, barring a major military disaster, one sees no reason to view the future with great concern either in Britain or in the United States.

However rosy the situation may appear just now, we must remember that we are living in an era of fast moving events with rapid social, political and economic changes and that these may affect health conditions just as they already have begun to affect us in other fields. No one can confidently predict the possible hazards of the future when among other factors we may not have even as high nutritional conditions as we have now, when soldiers in large numbers will be returning from tropical areas, and when other now unforseen factors, may be operative. While we may hope that conditions in the future, as in the past, will result in a general elevation of the public health of the Nation, it is quite conceivable that the reverse may occur.

Influenza, probably the most to be feared of all epidemics in temperate climates, and especially one to cause alarm in time of war, has so far, both in England and in the United States, been rather mild with little of the often serious complicating pneumonia. This was the experience of the first year of the present mobilization and let us at least indulge in the hope that it will continue through subsequent seasons.

In previous wars, cerebrospinal meningitis has been one of the major diseases among troops, and the civilian population also has suffered in a considerable degree. We can advise isolation of patients and contacts and search for carriers, but in truth, there is little we can do in a prophylactic way. Fortunately, the last few years have seen great strides in the therapeutic man-

agement of these cases and if published reports are to be trusted, some of the "sulfa" compounds have succeeded in reducing the death rate of cerebrospinal meningitis to a small fraction of what it was before.

The successful use early in the development of immunization of smallpox vaccine, diphtheria antitoxin and rabies vaccine have led to unwarranted optimism among the laity and to some extent among the medical profession as to the use of serums and vaccines in the prevention and cure of disease. This is well illustrated in antimeningococcic serum. Many years ago when it came into use, the current appraisal, almost without dissent, was that the serum had reduced the mortality of cerebrospinal fever from 75 to 25 per cent. This cheerful opinion of the profession persisted until very recent years, in spite of the fact that experience was demonstrating that the serum was far from being highly successful. As soon as effective chemotherapeutic agents came into use the serum rapidly fell into disuse and I think that in the near future we will be asking ourselves if it ever was worth anything.

In general I am to be numbered among the conservatives in the use of serums and vaccines and if I do not seem, in this paper, to be as enthusiastic as some of my friends you will understand that I have a weakness for controlled clinical evidence rather than for personal opinion. The results of animal experiments unsupported by data derived from the use of preventive and curative agents in the human species also leaves me cold. I am afraid that my conservatism is of such an order that given two reports, one affirmative, the other negative, presented by equally responsible workers, I am more likely to be influenced by the negative than by the affirmative results. I personally have seen so many pitfalls in the appraisal of prophylactic and therapeutic agents that you will have to make necessary allowances for what may seem a lack of enthusiasm on my part, excepting for well established biological products. Furthermore, admitting the benefit likely to be secured from a given preparation I want to know the risks incurred, from the infection under consideration, by the population. Let me illustrate again: The evidence of the value of Rocky Mountain spotted fever vaccine seems to be so well established that I would advocate its use in the areas in Montana and perhaps elsewhere where the disease is quite prevalent so that one would need to vaccinate only a few hundred persons to prevent one case; on the other hand I would not advocate its use in the Southern states where the disease is so rare that one would have to vaccinate many thousand individuals to prevent one case.

The immunizations and other preventive medicine needs of a civilian population in war time are the same as those in peace time, but effort should be made to accelerate and to intensify well thought out programs. The number of individual protective measures that need to be taken are limited.

We will put at the top of this list smallpox vaccination, the oldest and most effective of immunization procedures. We have in this the only certain measure for the prevention of smallpox; quarantine and isolation have their places but are of relatively little importance. There is some difference of opinion as to the age at which smallpox vaccination should be done. It is my own opinion that it cannot be done too early, but in any event, not later than the age of six months. It should be done again on entrance to school at about six years and thereafter whenever smallpox threatens or prevails.

There are two complications that need to be mentioned: First, postvaccinal encephalitis which usually is very rare, but when it does develop, it has most distressing possibilities. Fortunately, it occurs almost exclusively when vaccination is performed after the age of two. Obviously the preventive measure is early vaccination. Second, post vaccinal tetanus which has become almost obsolete since the practice of using shields and dressings has been almost universally discontinued.

As to the technic of vaccination I confess a preference for the multiple pressure

method, which is warmly advocated by J. P. Leake.[1]

Next in importance I would place diphtheria toxoid immunization of all suspectibles under 10 years, preferably at not later than one year of age. There is some difference of opinion as to whether we should use plain toxoid in three doses with intervals of three weeks to a month between them, or the more recently introduced alum precipitated toxoid with a little longer interval between the two doses now recommended for this preparation. When alum precipitated toxoid first was introduced we had high hopes that a single dose only would be necessary to give protection. With the accumulation of experience, however, it has been clearly established that two doses are much more dependable. It is noteworthy that only smallpox and diphtheria immunizations are stressed in "Child Health Day Program" of the Government: "Immunization against typhoid, tetanus, whooping cough and scarlet fever may also be performed when indicated in the judgment of the physician."[2]

Typhoid vaccination presents difficult problems in civilian populations, since it is by no means so surely effective as it appears to have proved in military experience. It should never replace well established sanitary procedures, especially purification of water supplies, adequate sewage disposal, milk control and carrier control, but may be used as a supplement to these. In recent years, thanks to the efforts of research carried out at the Army Medical School in Washington, typhoid vaccination has been modified and doubtless improved especially by the use of a strain of better antigenic qualities, and better tests have been devised for the efficiency of the vaccine. Possibly these improvements will result in more encouraging experiences with respect to civilian populations, but the newer vaccines have not been used on a large enough scale and over a long enough period to permit of final appraisal. It is clear to me that the decision as to this particular immunization procedure should depend somewhat on the extent of typhoid in a community. In many areas, especially Northern and Eastern states, typhoid fever has become so rare as not to justify the effort and the expense required to immunize the whole population. Even in many Southern communities, while the rates are much higher than in the North, it is a serious question as to whether they warrant general vaccination. Outbreaks of dysentery would require approximately the same control methods as typhoid fever except that in dysentery vaccination is impractical.

It is current practice to give tetanus toxoid simultaneously with diptheria toxoid and I can see no objection to this practice; indeed, I regard it with favor, although tetanus in the aggregate is so much less prevalent than diphtheria that one cannot make so good an argument for immunization against the former. In occupational groups in which the tetanus hazard is high tetanus toxoid immunization is imperative.

Whooping cough vaccination is becoming somewhat popular and on the basis of evidence probably should be used more widely than at present. It has the disadvantage of requiring more injections than most of the other vaccines and we lack tests to determine when immunization has been effected.

Immunization against scarlet fever is a problem about which I am not clear. The general policy has been to leave this to the judgment of the individual family physician rather than to have it applied on a community wide scale. I have no doubt that it is possible to immunize against the scarlet fever streptococcus toxin, but the requirements of a pre-immunizing Dick test, at lease five weekly injections of the toxin, and a post-immunization Dick test are just a little too much to be generally applicable. This taken with the relatively low fatality rates for scarlet fever in this country leaves me lukewarm on this particular subject. Scarlet fever convalescent serum and measles convalescent serum have their place of usefulness in passive prophylactic immunization of exposed children in special circumstances. They are not available for wide application.

The so-called placental extract or immune globulin of the pharmacopoeia for the prophylaxis of measles seems to have been well established. As you know, the aim ordinarily is not to prevent measles but to so modify the disease as to lead to a lasting immunity without danger to the child in the natural immunization due to an attack. To accomplish this the globulin must be given at just about the right time, that is, from five to seven days after exposure. Given earlier than this it is likely to prevent the disease and therefore prevent permanent immunization; given later it is likely to be ineffective.

The Army recently has tentatively adopted vaccination against certain of what we might call major epidemic diseases, yellow fever, plague, cholera and typhus. The Army appreciates fully the wholly experimental stage of these immunization procedures aside from yellow fever vaccination and doubtless will, in due time, give us an answer to the question of their efficiency. If I may deal with these briefly, my views might be summed up as follows:

Yellow fever vaccine seems to be highly effective, but the type of yellow fever conveyed by mosquitoes is, it seems to me, much more readily controlled by anti-mosquito measures than by immunization. The vaccine is a living virus given in a single dose. It is the only effective measure, so far developed against the jungle type of yellow fever, and for persons who are likely to be exposed to this its use is imperative. I see no likelihood that this type will be established in the United States.

With respect to plague immunization it is, in my judgment, of such uncertain value that I would prefer to ignore it in planning an anti-plague campaign, restricting myself to warfare against rodents, especially rats. The only type of anti-plague vaccine that seems to me to be effective is that devised by Otten[3] which consists of a living avirulent culture of *Pasteurella pestis* of high antigenic activity, but even this would hardly be required except under very special conditions where anti-rodent measures could not be carried out. Pneumonic plague, of course, requires early isolation of patients and contacts.

In view of the ever present threat of plague, rat control should be one of the health objectives of every seaport. This is especially true of communities on the Gulf of Mexico where experience has shown that plague may effect a foothold. It is well known that our Rocky Mountain states and, those farther West have sparsely distributed plague infection among wild rodents—especially ground squirrels. What in the way of an epidemic might develop from this under certain conditions cannot be predicted.

When we consider the various other diseases due to rats; endemic typhus and spirochetosis, and when we consider further the destruction due to the rodents, any community should place rodent control well up in the list of public health objectives.

With respect to cholera, nearly all the published data are favorable to anti-cholera vaccination, but most health authorities are a little uncertain as to the dependability of much of the published evidence. If I had to plan a cholera campaign it would be directed towards securing pure water, and pure food supplies with such attention as may be necessary to the discovery and isolation of cholera patients and carriers of the disease.

The problem with respect to typhus naturally divides itself into two parts, depending on whether we are dealing with epidemic, louse-borne typhus which is communicable from man to man through the body louse, or with the rat-borne disease which is transmitted from the rat to man by rat fleas. The latter is of such small importance that we hardly advocate vaccination, even if we had a certainly effective vaccine. Epidemic typhus, however, during and after wars has been a serious problem. Theoretically, it is easy to control this form of typhus by delousing measures and probably in practice the success of control efforts would definitely depend on the efficiency and speed of carrying them out.

The suggestion is made that the body louse prevalence is so low that under pres-

ent conditions in this part of the country it is not likely that epidemic typhus will become seriously prevalent. The same measures that are available against louse borne typhus should be effective against the louse borne type of relapsing fever. The aim of preventive measures against these diseases is the reduction of the human body louse. In thinking of the problem that would confront a health officer in relation to either I have wondered if the most effective readily available delousing facilities would not be those afforded by laundering and dry cleaning establishments.

Typhus vaccine is just now being made the subject of a large well-controlled experiment in South America. When the results of that test are available we should know pretty certainly just how effective this vaccine will prove to be.

The relation of the relatively mild typhus of rat origin and the malignant epidemic type is by no means clear and there is some uneasiness among health authorities as to the possibility of the former developing into the latter.

I might sum up by saying that with respect to this particular group of the major pestilences, I would prefer to depend on well tried measures of prevention which do not involve immunization procedures, with the sole exception of jungle yellow fever.

It is regrettable that the captains of the men of death among epidemic diseases, influenza and pneumonia, do not lend themselves to preventive measures. I am afraid we are no further advanced with respect to prevention of these diseases than we were when we went through the influenza pandemic of 1918. That situation might be summed up by saying that we could do little more than care for the sick. Attempts at preventive measures were unsuccessful. I am familiar with the brilliant work which has shown us that influenza is a virus infection, a multi-virus infection, one might say, and that there have been amazing advances in the treatment of pneumonia, but in each disease prophylactic immunization is still in the experimental stage, certainly not ready for widespread application. Influenza derives its evil reputation as a major threat chiefly by reason of the complicating pneumonia. Other pneumonias, especially pneumococcic pneumonias, are very largely amenable to successful treatment with some of the newer chemotherapeutic agents, but so far as I know, these drugs have not been used sufficiently in true influenzal pneumonias to make possible the appraisal of their value in this condition. This will show you that I believe influenzal pneumonia to be not merely a complication due to other organisms such as streptococci, pneumococci, and the influenza bacillus, but regard it as a separate entity due to the influenza virus or some other, as yet undiscovered, etiologic agent.

I suppose one of the most outstanding problems, especially in the South, in war time as in peace, is malaria control, but because this disease always is with us it does not attract our attention as some exotic but less important one might. While chemoprophylaxis has a limited part in malaria control it is not often practicable under civilian conditions. Prevention of malaria is a problem not often dealt with directly by the individual physician, excepting, of course, the therapeutic features. Prophylaxis concerns chiefly the sanitary engineer, the entomologist and other specialists found in our local, state, and federal health services.

The most important communicable diseases from the point of view of disability are those of the venereal group. I shall not consider them in detail, not because I regard them as outside the field of this discussion, but because I think they are being dealt with as satisfactorily as our social and economic system permits. The one message I would carry to my brother physician is this, if you are not yourself interested in, or in a position to handle, venereal diseases from the clinical or public health point of view, you should turn cases over to established public health agencies. I mean here especially, that if you are not prepared to undertake tracing of infections to sources, case finding of contacts, and case holding of those under treatment, you should not

simply ignore these features but place them in the hands of agencies in a position to deal with them. There are now nearly everywhere adequate public facilities for the rendering of such service as well as for the curative treatment necessary. The attitude of the leaders of our profession on the public health aspects of venereal diseases is well illustrated by the following:[4]

In 1876 J. Marion Sims, then President of the American Medical Association said, "So far as the well-being of the human race is concerned, I look upon the subject of syphilis as the great question of the day . . . and we must deal with it precisely as we deal with other great evils that affect the general health of the people." In 1942 Lahey, today President of the American Medical Association, from whose paper in a government publication (Venereal Disease Information, 23:85) the above is quoted, has the following to say:

"As private physicians, our responsibilities are of a dual character:

"(1) We must be prepared to play our part in the medical control of venereal disease in our offices and in the public treatment centers, and in our professional capacities we should confine ourselves to the medical aspects of the situation.

"(2) As responsible citizens in a democratic community—and as citizens with certain special experiences—we must play our part in the total community attack on venereal disease and on the conditions which foster its maintenance and spread.

"These are obligations which fall to us as practitioners of medicine—obligations not born of war, but accentuated by war; obligations that will remain through war and through peace until the battle against venereal disease is finally won."

Our methods of communicable disease control and our health measures in general have been built up in very favorable times—times of peace and reasonably liberal economic conditions, individual and collective. Now the margin between health security and health deterioration may be a narrower one than we think and it is conceivable that if National reverses should occur in this war there might be such changes in the health conditions as would throw us back many years, perhaps many decades; then, of course, the misery flowing out of adverse health conditions would be only one feature of a general demoralization of a people who have encountered military reverses.

Even with conditions as they are the suggestion has been made that the long continued gratifying decline in tuberculosis mortality, a reduction that never has been fully accounted for, may be about to be replaced by a rise in the morbidity and mortality from this disease.[5]

Bacterial warfare is hardly part of my assignment but it ought to be mentioned since it is a subject that has been somewhat in the news recently. It has been suggested that enemy nations might try to produce epidemic diseases among our civilian population by distributing bacteria or viruses causing infectious diseases of men or animals. This subject came up in World War I and at that time I had to spend some time trying to run down clues. Needless to say, hardly any of these developed into any tangible leads. One scare was that surgical dressings were alleged to be contaminated with tetanus. Rather to our surprise we found that one type of surgical dressing actually was contaminated with the tetanus spores, but clearly not with any intent to damage our population or our armed forces. I do not regard it as at all likely that warfare is to be conducted with infectious agents, not because it is forbidden by international conventions but simply because I cannot see how it likely could be made an effective weapon so far as human diseases are concerned. Conceivably, but improbably, localized outbreaks of typhoid, cholera or plague or some other infection might be started but it seems unlikely that they could become extensive enough to be of military importance. Certainly I would not be willing to advocate immunization against any of these that have been mentioned on account of any possible threat of the kind I am discussing and the same may be said of any other diseases I can think of. As recently as the March 9, 1942 issue of Time maga-

zine there was published a report that one of our enemy nations had tried to introduce plague infection into the Chinese civilian population of one of the north China provinces by dropping the germs from airplanes. I mention it for what you may think it is worth.

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THE DEFENSE OF CHILDREN

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For the first time in the history of our country we are faced with the problem of invasion of our land by enemies using a weapon of destruction which not only involves the military but the civilian population. In the past and until a short time ago the idea of total war injuring and killing women, children, handicapped and old people of the United States seemed a remote possibility. That that is now possible and probable makes it imperative to make immediate plans for the care of these groups of people.

We profit by the experience of Great Britain. In initial planning and retrospective improvement the British government had certain well defined principles and depended for their execution upon designated public and volunteer groups. The basic policy was dispersal of the non-essential population except for their protection. This evacuation was not compulsory except for military, industrial or other special reasons. But evacuation necessitated compulsory billeting of so-called priority classes in selected reception areas. These priority classes were school children, children under school age with their mothers, pregnant women, blind persons, and handicapped children. National registration was necessary for identification and keeping track of this mobile population. At the time of evacuation special means of identification for unaccompanied children were used. For mass evacuation transportation was arranged through the government. The initial cost was defrayed by the government but clothing and maintenance were parental responsibilities. Medical care was a primary concern. Examinations before evacuation with special recommendations to go with the child were found necessary after unfortunate experiences with pediculi, impetigo and other skin diseases as well as behavior problems. Hospital and isolation facilities had to be maintained or established in both evacuation and reception areas. Only partial transfer of school nurses and doctors in evacuated areas to emergency services to leave a minimum for care of unevacuated children was necessary. Nursing or medical supervision en route was provided for each group of evacuees by assigned nurses or doctors. Groups of children were sent by classes to a given area under the care of a familiar teacher to prevent or alleviate homesickness and behavior problems. Public health services in the evacuation areas included assignment of extra personnel, medical arrangements for school children and mothers with young children, hospital accommodation for emergencies, minor illnesses, and infectious diseases, and care of difficult children. Maternity care was carried out under an extension of a well-established peacetime plan for midwife care, hospital care and medical consultation. Pregnant women were billeted in private homes near which they could receive regular prenatal care. Delivery whenever possible was done in the billeting home by a midwife. Otherwise, it was done by a midwife or doctor in a maternity home or hospital. Special arrangements for care for two to four weeks in special convalescent homes was usually necessary as mothers and newborns were too heavy a burden

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for billeting homes. For problems of maladjustment of urban children and adults in billeting homes continuous aid by medical and social agencies was essential. Trained social workers with volunteers conducted mothers clubs and nursery centers with occupational and recreational facilities. Communal bath houses and laundries, and weekend hostels for husbands and fathers were established. For children in billets three needs had to be met besides food and shelter; love, companionship, and recall of parental loyalties. The Ministry of Education faced a difficult problem. The original closure of schools and transfer of school buildings for other purposes left unevacuated children at large. School and school medical services had to be resumed in evacuated areas. Meanwhile schools in reception areas were overburdened by the influx of evacuated children. This was met by taking over extra quarters, transferring equipment from evacuated areas, doubling shifts and mutual collaboration between rural and city teachers. Blind persons and handicapped children were evacuated as groups to camps. country houses or residential nurseries. Communal feeding arrangements in evacuated areas were an outgrowth of a prior school meal program or were established for resident and evacuated children. Parents were allowed to take advantage of the arrangements at cost price.

Thus in general did Great Britain follow through with remarkable success a long term plan for dispersal and care of her priority classes. We realize our need for similar planning for voluntary evacuation of our non-essential civilians. Our problem is greater because of greater distances between cities and reception areas, and our inadequacy of maternity care and child health and welfare in towns and rural areas. We need federal, state and local cooperation for ways and means of evacuation of children.

From federal agencies we need:

1. Designation of danger and safe areas.

2. Authorization for registration and identification of priority classes.

3. Authorization for assistance from state and local officials for facilities in safe areas with regard to housing, health, medical care, social services, education and recreation.

4. Extension of child health and maternity services in rural areas.

5. Provision for adequate financial assistance in execution of plans.

From states and local agencies we need:

1. Inter and intrastate cooperation in reception of evacuees.

2. Provision for extension of educational facilities in safe areas.

3. Planning for community feeding, recreation, laundry and nursery centers.

4. Cooperation in extension of medical services and child guidance clinics.

5. Organization and training of volunteers for child welfare service.

To follow through these plans we must realize the need for the protection and welfare of our children. We must organize under adequate leadership and accept our individual and group responsibilities. Large numbers of our children will be removed voluntarily from danger areas to relatives and friends in safe areas. But that will not relieve us of responsibility for continuing their health and educational supervision nor of responsibility for many families without such resources in safe areas.

Besides making provision for evacuation we must protect our children under bombardment. Civilian defense provisions include air-raid precautions in schools, construction and equipment of shelters, gas-masks, routine and emergency medical care, rest centers for bombed-out families, refuge for young children separated from parents, and communal feeding facilities.

In time of air-raid, children in school are to be taken by the teacher in groups of 50 or less to shelters or near-by houses. Teachers are advised in protection of windows, ventilation, sanitation, in protection against fire and gas, and provided with emergency rations. Subterranian or reinforced concrete shelters are to be equipped with sleeping accommodations, sanitary arrange-

ments, first-aid care, canteens, and personnel for assistance with children. Rest centers for bombed-out families are to provide accommodations for children and adults until evacuation is arranged. Bombed-out people and evacuees en route must be fed from community kitchens. Special gas-masks for children one to five years of age and respirator bags for infants are necessary. Parents are to be instructed in their use, and to accustom children to them. At home in time of air-raid infants and children are put in the selected, safest possible place. That refuge should have pillows or mattresses, blankets, diapers, gas-masks, first aid kit, playthings, water, milk and other foods, cotton wool for the ears of adults and children, and some make-shift sanitary arrangements. Outdoors a child is placed prone beside a wall or in a ditch on coat or cushion and covered with a coat. The parent should lie down beside the child. Above all a calm attitude in parent or attendant is the primary essential.

In Louisiana and New Orleans we recognize certain special difficulties for the protection of civilians. Due to terrain, subterranian shelters cannot be made available but reinforced concrete shelters can be constructed and are supposedly safe except against direct hits by bombs. Our country and city are vulnerable to flood which may endanger life and health by contaminating the water supply and by disrupting sewage disposal. Should gas be used, low-lying land is extremely vulnerable. Also our evacuation arrangements and air-raid precautions must be two-fold to care for both white and colored races.

Some idea of the number of persons in the priority classes for this Parish is given by the following data:

Statistics on Orleans Parish

Number of Children in New Orleans Mid-year 1942.

Under 6	38,002
6-18	108,496
Handicapped Children	269
Births in Orleans Parish	
January-December 1941	13,264
January-April 15, 1942	3,598
Average monthly births	1,088

Blind—No data available

The social agencies in this area exclusive of hospitals can be enumerated and roughly classified as follows:

Available Organizations and Welfare Agencies in Louisiana, Orleans Parish and New Orleans

	White	White and Colored	Colored
National	4	11	3
State	11	27	3
Parish	6	8	3
City	7	3	1
Religious	24	9	10

Total for colored and white—130.

A canvass should determine the availability of each organization for participation in defense, in evacuation planning and in reception arrangements. A register of the number and qualifications of the personnel would facilitate planning for their use as individuals or as units in emergency.

In conclusion, for the defense of our children we recommend immediate planning for evacuation to safe areas, for protection of children in danger zones, and for adequate care in both these areas. We feel that we can undertake these without panic and with the determination to fight on the home front as valiantly as do our soldiers on the military front.

DISCUSSION

Dr. W. R. Mathews (Shreveport): I should like to ask Dr. McCoy if he has an idea why there is a difference in the value of vaccination against typhoid fever in military personnel and the general public.

Dr. George W. McCoy (New Orleans): I have been asked that question many times. I have no explanation for it. Vaccination of military personnel seems to have been almost 100 per cent effective. With civilians it has been very much less effective.

Dr. R. T. Lucas (Shreveport): In answer to the question why the use of vaccines is not more effective, may I call your attention to one factor

in some cases. As most of you know, vaccines are very perishable and lose their potency rapidly unless kept properly refrigerated. Sometimes we have been careless and have used a vaccine that is not potent because it has not been kept properly refrigerated. This rapid loss of potency, if not properly refrigerated, should always be borne in mind in the use of vaccines, sera, and other biologicals.

Dr. Clyde Brooks (New Orleans): Touching the same point: I have found that the vaccine made and put out by the U. S. Army is strong, and that made and put out by civilian manufacturers is relatively weak.

Dr. George W. McCoy: That may be possible.

Dr. George H. Hauser (New Orleans): I would like to say a few words concerning the question just asked. The typhoid vaccine as manufactured by the Louisiana State Board of Health is prepared according to the technic as outlined by the United States Army Medical School. The use of the old Rawling attenuated strain has been discontinued, and in its place, the highly virulent Panama No. 57 strain, furnished by the Army Medical School, is now being used. This new vaccine gives higher immunity for a longer period of time.

Dr. C. A. Stewart (New Orleans): When typhoid occurs in immunized patients is it because the potency of the vaccine varies?

Dr. George W. McCoy: Two or three years ago there was a severe outbreak in the bayou district of about 100 cases in a short period. Many of them had been vaccinated and some had not been vaccinated. There were fatalities among those vaccinated, as well as among those not vaccinated.

Dr. W. R. Mathews: I wonder if the difference in the value of typhoid vaccination in the two groups could not be explained in part, at least, on the basis of sanitation. Under ordinary circumstances military circles have the advantage of good sanitation. The civilian population contracting typhoid fever, on the other hand, usually live under very poor sanitary conditions. We know that typhoid vaccination at its best is only relatively successful in protecting against the disease. Therefore, it would not be surprising if individuals without any sanitary protection should ingest sufficiently large doses of the bacteria to produce the disease in spite of vaccination.

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Medical and Surgical Journal

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THE CHARITY HOSPITAL SITUATION

The medical profession of the city and state has been dumfounded by the actions which apparently will see the closure of the Charity Hospital. It is almost unbelievable that this institution, which has been a refuge for the sick, ailing and injured for nearly 200 years, should close its doors. It is inconceivable that an institution which ranks as one of the great hospitals of the country should suddenly cease to function. When it is realized that there are more women delivered in the wards of Charity Hospital than in any other hospital in the country, that the number of patients admitted ranks third, with only two very large metropolitan centers, New York and Chicago, having more patients in their municipal institutions than Charity Hospital, when it is appreciated that the outpatient clinics treat more patients than any other hospital in the country, it seems impossible that the eleemosynary activities of this institution should suddenly cease. There must have been a tremendous need for the services of the institution or it would not have obtained the size that it now is. Certainly this need cannot abruptly stop; the people of Louisiana suddenly will no longer be sick or require operations or need treatment. If the Charity Hospital does close its doors on September first as is now threatened, where will the poor, the sick, the indigent get medical service? Certainly there is no hospital in the city that can begin to supply the needed services.

The Charity Hospital is not only used by the citizens of New Orleans but is used by the citizens of the entire state. The problem cases, the patients who require special forms of treatment, the people of Louisiana who need the services of skilled, trained specialists gravitate to New Orleans. At the smaller state institutions it is impossible to supply all the equipment, personnel and special services which make the cost of the Charity Hospital immeasurably greater than the ordinary institution, but these services must and should be provided.

Charity Hospital not only has the function of taking care of the indigent sick of Louisiana but it also provides a tremendous service to medical education and medical education nowadays connotes service to the country. There are being trained in the Charity Hospital approximately 600 young doctors and doctors-to-be who will go into the armed services when they have completed their training. Suddenly to stop this very necessary and much needed supply of physicians to the army and navy would not only be unpatriotic but would be almost equivalent to the action of a fifth columnist. Furthermore, the Charity Hospital has con-

tracted with the young interns and residents to give them training in return for the services they render in the hospital and this training will be very much needed in national defense.

Every public minded citizen, every individual with a thought to the underprivileged, and most decidedly every physician hopes and trusts and probably prays that the Charity Hospital will not be closed and that ways and means will be found to maintain the medical services rendered the needy by the state, by the unpaid medical staff, by the Sisters of Charity and by their nursing staff.

INTESTINAL ANTIBACTERIAL

Now comes the development of another sulfonamide, succinylsulfathiazole, a derivative of sulfathiazole, which is claimed to exert antibacterial activity on the flora of the intestinal tract. Studies show that it is only slightly soluble in water, poorly absorbed from the intestinal tract and that it produces a marked reduction in the colon bacilli and related organisms, exerts some antibacterial action on the various strains of the dysentery bacilli and inhibits the growth of the anaerobic bacteria.

The use of this drug in 100 patients is reported by Poth and Knotts.[1] Because a high concentration of the drug can be secured in the gastrointestinal tract with low blood levels these authors recommend its use "in the preoperative preparation and the postoperative control and treatment of patients requiring surgical procedures on the intestinal tract." In this manner the dangers of peritonitis are reduced and the postoperative course is smoother, with less distention and gas pains. They treated surgical cases including ulcerating carcinoma of the rectum, carcinoma of the colon, fecal fistulae, ileostomy, tumor of the cecum and ileosigmoidostomy.

The dosage recommended is 0.25 gm. per kilo of body weight with a maintenance dose of 0.25 gm. per kilo daily, divided into six equal portions and given every four hours. From one to seven days are usually required for preparation. Postoperatively the drug should be given as soon as the patient is able to take water without nausea, 0.25 gm. per kilo daily as before operation. This is continued for from one to two weeks. While its toxicity is apparently very low, frequent blood level determinations and urine examinations should be done to control its effects.

Further experience with the drug may verify these therapeutic successes and indicate the increased usefulness of the drug in intestinal infections of various types as well.

1. Poth, Edgar J., and Knotts, F. Louis: The clinical use of succinylsulfathiazole, Arch. Surg., 44:208, 1942.

STERNAL ROUTE FOR FLUIDS

In this day and time and especialy in the surgical emergencies of modern warfare, the parenteral administration of fluids is a most important, valuable and often lifesaving procedure.

Recently, Papper and Rovenstine[1] have pointed out the usefulness of the sternal marrow cavity as a route for the administration of whole blood transfusions, plasma, dextrose and saline solutions. Several years ago Tocantins et al. described the experiments showing that the sternal bone marrow absorbs fluids ordinarily given intravenously with equal efficiency. Under certain circumstances this route might be extremely useful. When veins are inaccessible because of injuries or burns over the accessible veins, with collapsed veins, generalized edema, or when thrombosis of accessible veins has occurred because of previous repeated intravenous injections, such a procedure is one well worth remembering and trying.

The technic described by these authors is not difficult. They recommend the use of a special needle, about 6 cm. in length with a stylet. Using a local anesthetic in the skin and the periosteum of the bone the puncture is made over the lower portion of the manubrium or the upper part of the body of the sternum. The needle is inserted in the midline, at about a 30 degree angle with the anterior chest wall, and is pushed into the sternal marrow cavity with firm pressure

1. Papper, E. M., and Rovenstine, E. A.: Utility of marrow cavity of sternum for parenteral fluid therapy, War Medicine, 2:277, 1942.

to pierce the outer table. The stylet is removed, and aspiration of marrow blood shows its correct position. The intravenous apparatus is then connected and the fluid administered as by the intravenous route.

MORTALITY AFTER CORONARY OCCLUSION

Anyone who has attempted to determine the prognosis in any group of patients with acute coronary occlusion and myocardial infarction knows how very difficult the problem is. Often when one least expects it and when the patient is doing well by all signs and symptoms one has at his disposal, death occurs suddenly and unexpectedly. Various studies have been made in order to establish signs that might be helpful in judging the prognosis. Among these unfavorable prognostic signs are unusually high fever, unusually high leukocyte count, marked fall in systolic blood pressure with low pulse pressure, tachycardia, and congestive failure. These indications of a poor prognosis are helpful, but there are no signs to assure us that the prognosis is good, and one must always fear the unexpected, especially in the first twelve to fourteen days following the acute episode.

In an attempt further to evaluate the factors that influence the immediate mortality, Woods and Barnes[1] studied 128 unselected patients. These figures are of considerable interest and throw additional light on the important problem.

Of these 128 patients, 60 died within six weeks of the acute attack and 68 were still living at the time of the report. The ratio of males to female was 5.4 to 1.

It has often been stated that the prognosis is better in cases of posterior infarction than in those of anterior infarction. In this series there was no difference whatsoever, 42% of both types suffered immediate death and 58% were living.

The complications which occurred within the first six weeks in the whole group showed a relative incidence as follows: pulmonary congestion 33.3%, congested liver 15%, pulmonary infarcts 10%, cerebral thrombi 15%, pericarditis 10%, rupture of the heart 3.3%, and vascular occlusion of extremity 1.7%.

Cardiac irregularities occurred much more frequently in the patients who died. Sinus tachycardia occurred in 31.7% of those patients who died and in only 17.6% of those who survived. Ventricular prematures occurred in 23.3% of the immediate deaths as contrasted with 11.2% in survivals. Frequent ventricular prematures, occurring every two to ten beats, were considered a very serious prognostic sign.

Age is the most important factor influencing the immediate mortality. In those patients 60 years of age or older the immediate mortality was 64.5%, while it was only 36.2% before 60 years of age.

The mortality rate was also higher in females than males, 75% in females as compared with 41.7% for males. Myocardial failure was also another important factor. The importance of ventricular fibrillation is well understood and frequent ventricular prematures are always likely to result in ventricular tachycardia or ventricular fibrillation.

Massive pulmonary emboli caused death in six of the 60 patients who died within the first six weeks.

1. Woods, R. M., and Barnes, A. R.: Factors influencing immediate mortality from acute coronary occlusion, Am. Heart J., 24:4, 1942.

TRANSACTIONS OF ORLEANS PARISH MEDICAL SOCIETY

AUGUST CALENDAR OF MEETINGS

August 3. Orleans Parish Medical Society, Board of Directors, 8 p. m.

August 4. Eye, Ear, Nose and Throat Staff, 8 p. m.

August 5. Clinico-pathologic Conference, Charity Hospital Morgue Amphitheatre, 1:30 p. m.

August 6. Clinico-pathologic Conference, Touro Infirmary, 11:15 a. m. to 12:15 p. m.

Baptist Hospital, Executive Meeting, 8 p. m.

August 12. Clinico-pathologic Conference, Charity Hospital Morgue Amphitheatre, 1:30 p. m.

August 17. Clinico-pathologic Conference, Baptist Hospital, 8 p. m.

August 19. Clinico-pathologic Conference, Charity Hospital Morgue Amphitheatre, 1:30 p. m.
Clinico-pathologic Conference, Hotel Dieu, 8:15 p. m.

August 20. Clinico-pathologic Conference Touro Infirmary, 11:15 a. m. to 12:15 p. m.

August 26. Clinico-pathologic Conference, Charity Hospital Morgue Amphitheatre, 1:30 p. m.
French Hospital Staff, 8 p. m.

August 27. Clinico-pathologic Conference Touro Infirmary, 11:15 a. m. to 12:15 p. m.

August 28. L. S. U. Faculty Club, 8 p. m.
New Orleans Hospital and Dispensary for Women and Children Staff, 8 p. m.

During the month of July the Society held one regular scientific meeting. The program was as follows:

1. History of Yellow Fever in New Orleans, by Dr. Rudolph M. Landry.

2. Vitamin Deficiency States in Louisiana, by Dr. Robert Lowe.

Reports of Officers and Committees, Second Quarter 1942, were also read at this meeting.

NEWS ITEMS

Dr. Donovan C. Browne read a paper on Gastroscopic Changes in Tuberculosis—Experimental Studies, at a meeting of the American Gastro-Enterological Association held in conjunction with the A. M. A. meeting in Atlantic City, June 8-12.

Dr. Donovan C. Browne also attended the American Gastroscopic Club meeting in Atlantic City.

At a recent meeting of the Diocesan Council of Catholic Women the following physicians were elected to office: Dr. Ruth G. Aleman was appointed chairman of the legislative committee; Dr. Katherine Havard, chairman of the speakers' bureau, and Dr. Maud Loeber was named chairman of the health committee.

Dr. T. A. Watters was elected vice-chairman of the Section on Nervous and Mental Diseases of the A. M. A. at the recent meeting of the Association in Atlantic City.

The following physicians addressed the Catholic Nurses Guild at recent monthly meetings: Drs. E. A. Bertucci, L. S. Charbonnet, Jr., Henry D. Ogden, J. O. Weilbaecher, Jr., and Edwin L. Zander.

Edwin L. Zander, M. D., Secretary.

LOUISIANA STATE MEDICAL SOCIETY NEWS

CALENDAR

PARISH AND DISTRICT MEDICAL SOCIETY MEETINGS

Society	Date	Place
East Baton Rouge	Second Wednesday of every month	Baton Rouge
Morehouse	Second Tuesday of every month	Bastrop
Orleans	Second Monday of every month	New Orleans
Ouachita	First Thursday of every month	Monroe
Rapides	First Monday of every month	Alexandria
Sabine	First Wednesday of every month	
Second District	Third Thursday of every month	

NEW ORLEANS GYNECOLOGICAL AND OBSTETRICAL SOCIETY

At the recent quarterly meeting of the New Orleans Gynecological and Obstetrical Society held at Mercy Hospital, Dr. William F. Guerriero read a paper on "Syphilis and Pregnancy."

Subsequent to the scientific program, in accordance with a report of the Nominating Committee, the following officers were elected for the coming year: Dr. J. W. Reddoch, President; Dr. Earl C. Smith, First Vice-President; Dr. Eugene Countiss, Second Vice-President; Dr. E. L. Zander, Secretary; Dr. H. B. Alsobrook, Treasurer; Dr. Lucien A. LeDoux, additional member of the Board.

This meeting was presided over by Dr. Lucien A. LeDoux, the present President of the Society.

HOW TO PROTECT AGAINST GAS

"The following information on war gases is supplied for general publication because of the possibility that they may at some time be used by the enemy. If people will remember a few simple facts, they will have no unreasonable fear of this agent.

"I. War gases stay close to the ground, for they are heavier than air. To get out of gassed area, simply walk against the wind or go upstairs.

"II. Gas is irritating and annoying to the eyes, nose, lungs, or to the skin, but it is usually harmless if you do not become panicky but promptly leave the gas area and cleanse yourself. A soldier must put on a mask where it is necessary to remain in the contaminated area, but a civilian can go up on the second or third floor and literally ignore it if the windows are kept closed.

"III. If the gas should get on your skin, you can prevent it from doing much harm by sponging it off as quickly as possible with a piece of clothing, such as a handkerchief, and applying some neutralizing substance, followed by a thorough bath, preferably a shower, with common laundry soap and water.

"IV. If you are indoors, stay there with doors and windows closed, and go up to the second or third story. Stay out of basements. Turn off the air conditioning, and stop up fireplaces and any other large openings.

"V. Some gases are spread as oily droplets which blister and burn the skin and eyes. If you are outside when gas is used do not look up. Tear off a piece of clothing or use a handkerchief to blot any drops of liquid from your skin and throw the contaminated cloth away. Blot: do not rub, as rubbing will spread the liquid. Then go home, if it is nearby, or to the nearest place where you can wash immediately with soap and water and cleanse yourself in the following manner:

"1. Remove all outer clothing outside the house, since gas can be transmitted to others from contaminated clothing. Put it preferably in a covered garbage pail.

"2. Apply one of the following effective household remedies to the part of your skin that has been contaminated; Chlorox or similar household bleach (for mustard); peroxide of hydrogen (for Lewisite); paste or solution of baking soda if you have no peroxide or bleach. If you do not know the gas, use both peroxide and bleach. Keep bleach and peroxide out of the eyes. Do not waste time looking for these remedies; bathe immediately if they are not at hand.

"3. After entering the house, wash the bleach or peroxide from hands with laundry soap and water and then wash the face. Remove the underclothing, place it in a covered garbage pail, and enter the bathroom.

"4. Irrigate the eyes with large amounts of lukewarm 2 percent solution of baking soda (one tablespoonful to a quart of water), or else with plain water. Use an ordinary irrigating douche bag or an eye irrigator. If you do not have these, let plain warm water pour into the eyes from the shower, washing them thoroughly. Do not press or rub the eyes.

"5. Lastly, take a shower, using laundry soap and hot water.

"6. If the nose and throat feel irritated, wash them out also with baking soda solution.

"7. If your chest feels heavy and oppressed, if you have any trouble breathing, or if cigarette smoke becomes distasteful, lie down and stay perfectly still until a doctor sees you.

"8. If blisters develop, be careful not to break them and call a doctor.

"REMEMBER: Soldiers require gas masks because they must remain in the contaminated area. Civilians can get out of the gassed area or get above the level of the gas, where they do not need gas masks or protective clothing.

"Injured persons, who are gassed, require decontamination before they can be admitted to hospitals. All other civilians can best prevent any serious injury by promptly helping themselves in the manner outlined, using a kitchen or bathroom, laundry soap and water, and a few materials found in every household."

James M. Landis,
Director, Civilian Defense.

AMERICAN PHYSICIANS' ART ASSOCIATION

The fifth annual exhibition of the American Physicians' Art Association was held June 8-12, 1942, at Atlantic City, N. J., in Convention Hall, under the same roof with the American Medical Association.

This exhibition was enthusiastically acclaimed the most attractive one of the entire convention, as evidenced by the fact that the 40'x60' room was filled with visitors at all times. There were 350 original art works, a large number considering war time. Seventy-three prizes were awarded.

Under the new rules, no artist may receive more than one award in one year. No private or commercial prizes are permitted, all prizes being the Association's.

COURSE IN PHYSICAL THERAPY

"Columbia University announces that beginning September, 1942, a program of professional studies for the training of Physical Therapy technicians will be offered. This training and instruction will extend over a two-year period and has been organized in compliance with the requirements set down for such programs by the Council on Medical Education and Hospitals of the American Medical Association. The course is being set up in University Extension in close relationship with the College of Physicians and Surgeons of Columbia University, the Nursing Education and Health and Physical Education Departments of Teachers College. The clinical and laboratory instruction will be given at the Vanderbilt Clinic, Neurological Institute, Presbyterian Hospital and New York Orthopedic Dispensary and Hospital.

"Two years or 60 semester hours of college, including courses in Physics and Biology, shall be required, or graduation from an accredited School of Nursing or an accredited School of Physical Education.

"A certificate of Proficiency in Physical Therapy will be granted by Columbia University to those completing the course. Further information may be obtained by writing the Office of the Committee on Physical Therapy, Room 303B, School of Business, Columbia University, New York City."

William Benham Snow, M. D.,
Chairman, Advisory Committee
on Physical Education.

THE AMERICAN CONGRESS OF PHYSICAL THERAPY

Will hold its twenty-first annual scientific and clinical session September 9, 10, 11 and 12, 1942 inclusive, at the Hotel William Penn, Pittsburgh, Pa. The annual instruction course will be held from 8:00 to 10:30 a.m., and from 1:00 to 2 p.m. during the days of September 9, 10 and 11 and will include a round table discussion group from 9:00 to 10:30 a.m., Thursday, September 10. The scientific and clinical sessions will be given on the remaining portions of these days and Saturday morning. All of these sessions and the seminar will be open to the members of the regular medical profession and their qualified aids. For information concerning the seminar and program of the convention proper, address the American Congress of Physical Therapy, 30 North Michigan Avenue, Chicago, Illinois.

THE AMERICAN COLLEGE OF PHYSICIANS

The American College of Physicians has announced its 27th Annual Session to be held in Philadelphia, Pa., April 13 to 16, inclusive, 1943. Heretofore, the College has held a five-day Session, but in the interest of conserving time and expense of its members, the program will be condensed into four days, Tuesday through Friday. Dr. James E. Paullin, Atlanta, as President of the College, will have charge of the program of General Sessions and Lectures. Dr. George Morris Piersol, Philadelphia, as General Chairman, will be responsible for the program of Hospital Clinics, Panel Discussions, local arrangements, entertainment, etc. The general management of the session and technical exhibits will be handled by the Executive Secretary, Mr. E. R. Loveland, 4200 Pine St., Philadelphia.

THE RICHMOND MEETING OF THE SOUTHERN MEDICAL ASSOCIATION

Since the press release by Mr. Joseph B. Eastman, Defense Transportation Director, the latter part of last week we have had letters and long distance telephone calls asking the status of our Richmond meeting. Our leading newspaper gave this press release under a Washington date line in this form: "The government asked Friday that all state and county fairs, non-essential conventions, meetings and group tours, be postponed until the was is over." Note this uses the term "non-essential conventions."

We hold that the Southern Medical Association meeting in November will be an essential convention, that in no sense does it come within the groups mentioned in the press release of Mr. Eastman as quoted above. It is our contention that our meeting can and will be of definite service to the government and to the people in these war times. It can be of service in the mobilization of physicians for war service as was our comparable meeting twenty-five years ago of service to World War I. There are many physicians in our territory who will have to broaden their civilian practice, who will have to do medical work they have not done in years. Our meeting will afford these physicians an opportunity to freshen up and this will mean a better service to the civilian population in these war times.

Until we have something more specific than we have now, until a responsible agency of the government specifically rules that ours is a non-essential convention and will not be entitled to transportation facilities, if transportation is rationed, we are going ahead with plans for a meeting. Just now we are not thinking of the possibility of not having our meeting in Richmond. We feel we should go ahead with perfecting the plans for it will be much easier to call the meeting off on short notice than it will be to get it ready on short notice. Let's be prepared.

C. P. Loranz,
Secretary-Manager.

EXAMINATIONS
AMERICAN BOARD OF OBSTETRICS AND GYNECOLOGY

The next written examination and review of case histories (Part I) for all candidates will be held in various cities of the United States and Canada on Saturday, February 13, 1943, at 2:00 p. m. Candidates who successfully complete the Part I examination proceed automatically to the Part II examination held later in the year. All applications must be in the office of the Secretary by November 16, 1942.

Effective this year there will be only one general classification of candidates, all now being required to have been out of medical school not less than eight years, having in that time completed an approved one year general rotating interneship and at least three years of approved special formal training, or its equivalent, in the seven years following the interne year. This Board's requirements for interneships and special training are similar to those of the American Medical Association since the Board and the A. M. A. are at present cooperating in a survey of acceptable institutions. All candidates must be full citizens of the United States or Canada before being eligible for admission to examinations.

NEWS ITEMS

Dr. Roy B. Harrison, of New Orleans, was recently elected a member of the National Board of Medical Examiners for a term of four years.

Dr. David E. Brown, of Ferriday, was recently appointed Director of the Louisiana State Board of Health to succeed Dr. C. L. Mengis.

THE CONWAY CHARITY HOSPITAL

It was announced on July 1, that Dr. C. P. Gray would become superintendent of the E. A. Conway Charity Hospital in Monroe, replacing Dr. D. T. Milam.

Assistant Surgeon James A. Finger is on duty at the U. S. Coast Guard Training Station, New Orleans, having been relieved from duty at the U. S. Marine Hospital on May 25.

Assistant Surgeon Bruce Cominole has proceeded to Boston for duty aboard the Coast Guard Cutter Tahoma.

Past Assistant Surgeon Samuel J. Nichamin has been relieved from duty in New Orleans and will proceed to Monroe, Louisiana, to establish headquarters for duty.

HEALTH OF NEW ORLEANS

The Bureau of the Census, U. S. Department of Commerce, has reported that for the week ending June 20, there were 160 deaths in the City of New Orleans, divided 105 white and 55 negro, and of this total there were eight children under one year of age, divided equally between the two races. The following week, which ended on June 27, there was a decrease in number of deaths in the city; 79 white deaths and 42 negro deaths being reported. This week there were nine deaths occurring in children under one year of age; seven white and two negro. The week ending July 4 showed an increase in number of deaths when 150 were reported. The deaths in the white population still outnumbered those in the negro indicated by 98 being reported for the former and 52 for the latter. There were 22 infant deaths this week, divided 12 white and 10 negro. One hundred and twenty-nine deaths, divided 88 white and 41 negro, were reported for the week ending July 11. There was quite a decrease in number of infant deaths this week; only three reported in the white race and one in the negro.

INFECTIOUS DISEASES IN LOUISIANA

The morbidity report of the Section of Epidemiology of the Louisiana State Board of Health for the week which closed June 20 showed syphilis leading all other reportable diseases, with 627 cases listed during this particular week. Other diseases occurring in numbers greater than ten include 50 of gonorrhea, 25 of measles and 24 of pulmonary tuberculosis. There were five cases of diptheria reported, one case from each of the following parishes: Acadia, Orleans, Madison, Richland and Winn. Natchitoches and Winn Parishes each reported one case of malaria; Rapides and Vermilion one case of meningococcus meningitis; Jefferson and Lafayette one case of poliomyelitis; East Baton Rouge, Jefferson and Orleans one case of scarlet fever; Jefferson, Lafourche, Orleans and Vermilion one case of typhus fever; and Lafayette and Natchitoches one case of undulant fever. Two cases of typhoid fever were reported from East Baton Rouge and St. Mary Parishes, and Madison, Orleans, and Rapides each reported one. There were five cases of whooping cough in Orleans Parish and four in St. Mary Parish. Syphilis again led all diseases reported for the week ending June 27 when 307 cases were reported. Gonorrhea followed with 58 cases and there were reported 54 of measles, 44 of pulmonary tuberculosis, 41 of whooping cough, 26 of bacillary dysentery, 17 of malaria, 13 of mumps, and 12 of septic sore throat. Of the whooping cough cases reported, 30 were from West Carroll Parish, five from Jackson, three from Orleans, two from Caddo and one from St. James. There were seven cases of diphtheria reported; one each from Acadia, Caddo, Orleans, Vernon and Vermilion Parishes, and two from Rapides. One case of meningococcus meningitis was reported in Orleans Parish and one case of poliomyelitis from Caddo, Orleans, Sabine, Vernon and Washington and two from Rapides. Jackson, Orleans and St. Tammany Parishes each reported one case of undulant fever; Bienville and Caddo, one of typhoid fever and Washington two of typhoid fever. Scarlet fever was reported by three parishes; Jackson two cases, Orleans one and Vernon one, and one case of paratyphoid fever was reported by Orleans and St. Landry Parishes. There was a decrease in the number of cases of syphilis for the week ending July 4; 223 cases being reported this week. Other diseases reported by figures larger than ten were as follows: 21 cases of gonorrhea, 15 of measles, 17 of pulmonary tuberculosis, and 11 of typhoid fever. There was only one case of diphtheria reported; one case of meningococcus meningitis; and one of paratyphoid fever; all occurring in Orleans Parish. Concordia and East Baton Rouge Parishes each reported one case of poliomyelitis, and East Baton Rouge, Jackson, Lafourche and Orleans each reported one case of scarlet fever. The typhoid fever cases were scattered throughout the state, there being one reported by East Baton Rouge, two by East Carroll, one by Iberville, two by Jefferson, three by Orleans, one by Richland, and one by Washington. The only case of typhus fever reported was from Jefferson Parish. Malaria was reported by three parishes; Jackson eight, Orleans one, and St. Tammany one. The report for the week ending July 11 showed an increase

of 110 cases of syphilis, a total of 333 being reported. There were 91 cases of gonorrhea, 33 of pulmonary tuberculosis, 24 of measles, 23 of typhoid fever, and 17 of mumps. The typhoid fever cases were reported from 12 parishes; Bienville one, Calcasieu one, DeSoto three, East Baton Rouge one, Jackson one, Madison one, Morehouse three, Ouachita two, Rapides one, Richland two, Vermilion two and West Carroll five. One case of meningococcus meningitis was reported from Rapides; one case of paratyphoid fever from Calcasieu; and one case of poliomyelitis from Ouachita. There was one case of scarlet fever reported from each of the following parishes: Iberville, Orleans, and Sabine. Five cases of malaria were reported by Ouachita Parish and one by Rapides. Diphtheria was reported by Jefferson Davis, Orleans and Rapides Parishes; the first having two cases and the other two parishes having one each. Orleans Parish reported two cases of typhus fever and Calcasieu and Rapides each reported one. Nine cases of whooping cough were reported this week; five from Jefferson Parish, three from Orleans, and one from East Baton Rouge.

BOOK REVIEWS

Management of the Sick Infant and Child: By Langley Porter, B.S., M.D., M.R.C.S. (Eng.), L.R.C.P. (Lond.) and William Carter, M.D. 6th rev. ed. St. Louis, C. V. Mosby Co., 1942. Pp. 977, illus. Price $11.50.

This volume is more detailed in description of disease than the Compleat Pediatrician, but not as complete as the authorities Holt, Mitchell or Brennemann. Part III on Methods, on the other hand, is most detailed, more descriptive and helpful than in any other volume the reviewer knows. The pictures showing the actual way of doing things, diets and prescriptions, should prove of great value to anyone interested in pediatrics.

SUZANNE SCHAEFER, M. D.

Bacillary and Rickettsial Infections, Acute and Chronic, A Textbook. Black Death to White Plague: By William H. Holmes, New York, The Macmillan Company, 1940. 676 pp. Price $6.00.

Although this book is titled "A Textbook", it is not a conventional type of text. Rather, it appears to be a somewhat edited series of lectures dealing with the subject of certain bacillary and rickettsial diseases. This method of writing makes a very readable book, especially since the subject matter is not limited to epidemiology, etiology, symptoms, signs, and treatment. In addition it covers the history of the diseases, short discussions of the derivation of terms, adequate quotations from historically significant original articles, and interesting biographic notes on men who played a part in the development of knowledge of these diseases. This is particularly valuable in case of the more unusual diseases such as cholera, plague, typhus, tsutsugamuchi fever, and leprosy.

The book can be recommended for its educational qualities because of the large amount of "background" material. As for the "practical" data presented, they are adequate but not detailed. For this reason it cannot be considered as a reference book for clarifying deviations from the average in the individual case. Chapter 36, covering anthrax, glanders, erysipeloid, fusospirochetosis, and oroya fever, is entirely too brief to fit in well with the rest of the book. It reminds the reader of a lecturer who has overstaid his hour and has to rush to finish.

Certain criticisms of format may be justified. The bibliographies are not consistent. Some references occur as footnotes, and the rest at the end of the chapters. Furthermore, the marginal notes take up space that could better be utilized otherwise. They add nothing that could not be briefly covered in the text.

ROBERT C. LOWE, M. D.

Brucellosis (Undulant Fever). Clinical and Subclinical: By Harold J. Harris, M. D. New York, Paul B. Hoeber, Inc., 1941. Pp. 286, illus. Price $5.50.

This book, written by one keenly interested in the diagnosis and treatment of brucellosis, represents an attempt to bring together the important facts in the handling of patients with this disease. The author stresses clinical aspects and illustrates his points with numerous cases drawn from his own experience. It is unfortunate that he does not clearly differentiate the symptoms due to brucellosis from those incidental to the disease. Emphasis is placed on the chronic stage of the disease, which is indeed its most neglected aspect. Details of diagnostic procedures, with their interpretation, include not only the clinical history and findings, but the various important laboratory procedures, such as culture of the organisms, agglutination and skin tests, and the opsonocytophagic index. Yet at times the author strays from these procedures in doubtful cases and depends upon the therapeutic test with brucella vaccine.

A discussion of the various forms of treatment describes, in a large part, the author's own experience, but the literature is called upon extensively for evaluation of the procedures. Stress is laid on vaccine therapy in the chronic stages of the disease.

Chapters on epidemiology and on public health and medicolegal aspects are included.

W. A. SODEMAN, M. D.

The Treatment of Burns: By Henry N. Harkins, M.S., M.D., Ph.D., F.A.C.S. Springfield, Ill. Chas. C. Thomas Co., 1942. Pp. 457, illus. Price, $6.50.

After carefully reading this volume, on this important and rather timely subject, the reviewer was especially impressed by the thoroughness with which the author has covered the subject of burns. Although the title might give the impression that this is a monograph dealing only with the therapy of burns, the author has likewise very properly included all other phases of this subject as well. The result, in the writer's opinion, is a book on burns which is perhaps the most complete and comprehensive volume on this subject thus far written.

The review of 1320 references, bringing the bibliography up to November 1, 1941, will give the reader some idea of the author's enormous undertaking as well as the completeness of the subjects covered. Accordingly, this thoroughness makes this volume not only one of great value to the clinician, but likewise to the investigator on burns; and to the experimentalist and biochemist as well. Each will find, concisely considered, those phases, and especially those problems, in which he is particularly interested. A glance at the bibliography shows that the author's complete review of the literature covers every conceivable phase of burns.

The author divides his book into four parts. The first of these deals with "The Burn and its Effects." Part two covers every angle of the subject of "Treatment." The third part rather thoroughly considers "Special Burns"; and a "Practical Outline of Burn Treatment" constitutes the fourth and concluding part of the volume.

A sufficient number of tables, diagrams and photographs help enhance the value of this contribution. The reviewer feels that this book will serve as a valuable reference work on the subject of burns for many years.

FRANK L. LORIA, M. D.

The Prevention of Deformity in Childhood: By Richard Beverly Raney, B.A., M.D. in collaboration with Alfred Rives Shands, Jr., B.A., M.D., Elyria, Ohio, National Society for Crippled Children in the United States of America, Inc. 1941. Pp. 188, illus. Price $1.00.

"Often the observance of simple preventive measures will forestall serious deformities, while neglect of these same measures, through ignorance or other causes, will not only allow the deformities to develop but may allow them to become so advanced that their subsequent correction becomes impossible. It is therefore important that those who first see the affected children should possess a knowledge of preventive treatment. In most cases these individuals are the family doctors, the welfare workers, or the public health nurses." In this passage in the preface Dr. Raney has presented the theme of this useful booklet. This carefully planned primer is, therefore, written for family doctors, welfare workers, public health nurses and workers in organizations for the care and treatment of crippled children.

A short section at the beginning of the book is devoted to the definition and description of the commoner groups of crippling conditions with a few words on the prevention of each of these. The commoner deformities of the upper extremity have been described and illustrated. The principles of treatment for each condition are outlined but emphasis is placed upon preventive measures. In the same way, deformities of the lower extremity and trunk are discussed. As explained in the preface, the illustrations are drawn from various sources. They are simple line drawings which make possible adequate visualization of the condition described.

The primer is so well designed and meets such a prevalent need that one hesitates to offer any criticism. It is probable, however, that in subsequent editions the authors will want to introduce some comments on the advantages of the Kenny treatment in the management of the early stages of infantile paralysis as a means of preventing respiratory paralysis and some of the worst contractures. There is such a tremendous field for preventive and corrective measures of foot defects and postural deviations particularly during preparatory school and college years that it would be desirous to emphasize these possibilities a great deal more than has been done in this small primer. However, the absence of these from the present edition does not seriously diminish its value to lay and welfare workers to whom it is heartily recommended.

GUY A. CALDWELL, M. D.

Foundations for a Science of Personality: By Andras Angyal, M.D., Ph.D. New York, The Commonwealth Fund, 1941. Pp. 398. Price, $2.25.

In this book the concept of "the personality as a whole" has been extended to include the individual and the environment together as a unitary process (the process of living) rather than as two interacting factors. The trend of this unitary process is both towards self-expansion of the individual, with a tendency toward acquisition of greater influence over the events of his particular milieu, and towards conformity and oneness with such "superindividual wholes" as society and culture.

Use is made of Gestalt psychology in developing the author's thesis; and he draws upon psychobiology, logic, Lewinian psychology, psychiatry, philosophy, biology, and Freudian concepts in the construction of his holistic theory of personality.

New concepts are applied to "the organism as a whole" and to the problem of personality integration.

The book should prove of interest to the worker in the field of personality problems, whether his approach be from the psychiatric, psychologic, sociologic or biologic point of view.

T. A. WATTERS, M. D.

The Avitaminoses, the Chemical, Clinical, and Pathological Aspects of the Vitamin Deficiency Diseases: By Walter H. Eddy, Ph.D. and Gilbert Dalldorf, M.D. 2d ed. Baltimore, The Williams and Wilkins Company, 1941. Pp. 519. Price, $4.50.

In this day of rapid advances in all aspects of our knowledge of the vitamins it is a practical necessity to re-edit such a volume as this frequently. In this second edition of "The Avitaminoses" much has been added in the way of proved material. Little speculation enters into the text. The characteristic which might be judged inadequate in the book is the clinical discussion including diagnosis and treatment. One might suggest that the short appendix of methods for laboratory estimation of vitamin deficiency could better be incorporated in the text under diagnosis. More emphasis on the interpretation and limitation of laboratory findings would be of value.

The bibliographies at the end of the chapters are pertinent, and consist of the more significant references. They make no pretense of being complete.

The book is a worth while one for those in practice interested in keeping up with the chemical and pathologic knowledge of the subject treated.

ROBERT C. LOWE, M. D.

Arthritis and Allied Conditions: By Bernard I. Comroe, A.B., M.D., F.A.C.P. Philadelphia, Lea & Febiger, 1941. Pp. 878. Price, $9.00.

The author is to be congratulated on the value of the practical and scientific material presented in this treatise of arthritis Seldom does one see such voluminous amount of important facts presented in a form easily assimilated by the student, the specialist, or general practitioner. The many beautiful illustrations add accuracy to the treatise. Of special interest are the many new chapters dealing with allied arthritic subjects brought minutely to the present day streamlined conception of these diseases. A complete reference list follows each chapter which will furnish sufficient material for use of any investigator. The placing of a synopsis of the diagnosis, treatment and so on, of any special disease discussed, is very unique, and puts in a compact form the salient features desirable in all cases.

This should be read by all physicians, whether specialist, student, or general practitioner. The reviewer is sure this second edition will prove even more popular than the first.

P. T. TALBOT, M. D.

Nasal Sinuses: An Anatomic and Clinical Consideration: By O. E. Van Aylea, M.D., Baltimore, Williams and Wilkins Company, 1942. Price, $6.50.

Van Alyea has presented this subject with considerable brevity but also with remarkable clarity. His literary style makes it a pleasure to read this book from cover to cover. His ample and critical clinical experience has been built on thorough familiarity with the anatomy and physiology of the sinuses.

A bibliography is given at the end of each chapter and the references are on the whole, to sources which are readily available to the reader in this country. This is a valuable feature.

The author decries unnecessarily radical sinus surgery such as ablation of all ethmoid cells when a limited infection exists.

He mentions infraction of the middle turbinate as a highly valuable, often neglected, simple office procedure.

The illustrations are clear and informative.

The book is heartily recommended to both the student and the specialist.

H. L. KEARNEY, M. D.

PUBLICATIONS RECEIVED

American Pharmaceutical Association, Washington, D. C.: The National Formulary, Seventh Edition.

The Blakiston Company, Philadelphia: Morris' Human Anatomy, Tenth Edition, edited by J. Parsons Schaeffer, A. M., M. D., Ph. D., Sc. D. Principles of Extraperitoneal Caesarean Section, by James V. Ricci, A. B., M. D., and James Pratt Marr, M. D., F. A. C. S.

Henry Holt and Company, New York: Ambassadors in White, by Charles Morrow Wilson.

Lea and Febiger, Philadelphia: The Pathology of Trauma, by Alan Richards Moritz, M. D.

W. B. Saunders Company, Philadelphia: Manual of Standard Practice of Plastic and Maxillofacial Surgery, prepared and edited by the Subcommittee on Plastic and Maxillofacial Surgery of the Committee on Surgery of the Division of Medical Sciences of the National Research Council, and representatives of the Medical Department, U. S. Army. Treatment in General Practice, by Harry Beckman, M. D.

Charles C. Thomas, Springfield, Illinois: Intestinal Obstructions, Second Edition, by Owen H. Wangensteen, B. A., M. D., Ph. D. Plastic Surgery of the Breast and Abdominal Wall, by Max Thorek, M. D., LL. D., F. I. C. S., F. I. C. A. The Ophthalmic Formulary, compiled by G. Griffin Lewis, M. D., F. A. C. S.